. . . and as you can see . . .

A Manual for Teachers with a Partially Sighted Pupil in a Regular Classroom

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M199
1984

D. Ross McKenzie
Mus. Bac., Dip. Tchg. (Special Education).

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BIOGRAPHICAL NOTE

Ross began his involvement with the education of the visually impaired in 1961 while in England, where he taught at Blatchington Court School for partially-sighted boys in Seaford, Sussex. After four years there, and visiting several of the schools for blind and partially-sighted in the U.K., he returned to New Zealand where he has worked at Homai College in several capacities since 1965 — Senior Teacher Braille classes, Senior Teacher Print clases, established the multi-handicapped (pre-vocational) training programme at the College, Itinerant Teacher and Acting National Adviser for visually impaired children integrated throughout New Zealand schools for three years. As a result of this part of his work, he felt a great need that regular classroom teachers should have more information on the education of visually impaired children than was currently available, so he set about meeting this need by providing this book.

A graduate in 1960 with a music degree from Auckland University, and a diploma study in special education, Ross and his wife share a common interest in dog-breeding. Animals help him relax by providing a counter-balance to a very intensive professional involvement. He is currently commited to expanding and promoting the services of the Auckland and National Resource Centres which support visually impaired students who are integrated into a regular classroom, working with pupils from new entrants to tertiary level.

G. Gibbs
Director
Royal New Zealand Foundation For The Blind
Auckland.

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PREFACE

Why write this book?

The answer is threefold — it is a response to requests for information; it gives me a chance to clarify many of my own ideas; it allows me to share my experiences with a wider range of people.

In the process of researching to enable me to respond knowledgeably to queries from teachers, I have noted that there is a lot more written about coping with totally blind students than there is about the partially sighted. The reason for this could be that the parameters of blindness are less variable than those of limited vision; if the pupil is blind, he has NO sight and you can disregard the utilization of residual vision altogether, and the procedures for his education are pre-ordained, well documented, and relatively inflexible in their application. If, on the other hand, there IS sufficient sight, current philosophy dictates that this sight should be developed and used to its full potential. And there would appear to be as many variations of "usable vision" as there are people catagorized as "partially sighted"! Providing meaningful information about this wide range of variation is a formidable task — each case would require its own interpretation of the facts, with subsequent applications to the thousands of visual tasks performed daily by the child in the variety of situations he encounters in the course of living and learning.

Obviously, some generalizations are possible, but comments contained in this book have been influenced by the frequency with which questions have been asked by the several agencies and professionals associated with the general support of visually impaired students in schools and educational centres throughout the country. The consistency with which similar information is requested bears directly on the number of students exhibiting similar visual problems (from whatever cause). I have concentrated, therefore, on the more common conditions, and the problems they tend to precipitate. I have endeavoured to keep the jargon and medical terms to a minimum, so that ophthalmically untrained and inexperienced readers are not swamped in terminology that becomes burdensome. For this reason also, I have placed the Glossary, optical diagrams and charts at the front of the book for easy reference.

While the main thrust of this book is towards providing help to the classroom teacher, others may find it of assistance — school principals, parents, visiting and itinerant teachers, psychologists, advisers in special education, guidance counsellors, and (dare I say it?) some ophthalmologists. By way of explaining this last statement, it has been my experience on a few occasions to have encountered the eye specialist who has failed to prescribe adequately for the educational needs of his patient, being unaware or uninformed of the difficulties within the classroom of constantly changing focal distances (near, to far, and back again), requirements in the necessity to locate, identify and visually process the fine detail in maps, charts, diagrams, etc, and generally appreciate the variety of visual tasking required of the pupil. I must say, however, that a personal approach to these eye specialists, to discuss the specific problem, has resulted in the difficulties being adequately resolved, much to the delight of both pupil and educator.

I must pay tribute to many of the teachers themselves who have come up with interesting solutions to knotty problems. These ideas have come to the fore as we have sat together trying to find "something that might work" in a particular situation. Experimentation then followed, records were carefully kept, and observations made. In some cases these ideas were adapted to similar situations elsewhere in the country. Results varied according to attitudes, ability, enthusiasm, other factors, persistence, etc.

I have also had considerable support and invaluable assistance in gathering information for this book from my Itinerant Teachers of the Visually Handicapped, Jan Thorburn and Steve Bellamy, and (in the early stages) Francis Kinnaird, and from the Resource Room supervisors Adrianne Cranshaw, Carol Donaldson and Charles Walsh. Acknowledged also is my professional association with the braillist Margaret Newman, who, as a part-time volunteer for the inaugural years helped to establish the National Visual Resource Centre at Homai College, and whose vast knowledge in tactile and heavy-line material preparation has got the Centre off to a good start. I wish to acknowledge with sincere gratitude the financial support for this venture from members of my family.

This book, then, becomes an accumulation of ideas, experiments, observational records, principles and information (all of which have succeeded and/or failed at various times and in certain situations), gleaned over my 23 years in the field of the education of the visually impaired, including 3½ years travelling throughout New Zealand as Acting Adviser on Visually Handicapped Children for the Royal New Zealand Foundation for the Blind. It is dedicated with affection and appreciation to those I seek to help — the visually impaired child.

Auckland,
April, 1984

GLOSSARY

The terms found in this glossary have been adapted from several sources, some hereby acknowledged, others from verbal explanations provided by ophthalmologists as a result of my questions. Publications include the National Society for the Prevention of Blindness publication P-607 "*Vocabulary of Terms Relating to the Eye*", Dr Roy O. Scholz's book "*Sight — A Handbook for Laymen*", and Virginia E. Bishop's book "*Teaching the Visually Limited Child*".

Accommodation — The ability of the eye to change focus through near, middle-distance and far, so that a clear image falls on the retina. This change is accomplished by the ciliary muscles changing the thickness of the lens. Anything beyond 20ft away does not need any alteration in the relaxed shape of the lens in order to be in focus.

Acuity — See Central Vision Acuity, and Visual Acuity.

Albinism — Partial or total absence of colour pigment in the body make-up, affecting the iris, skin and hair. Frequently associated additional visual anomalies include nystagmus, photophobia. refractive errors and decreased visual acuity.

Amblyopia — Reduced binocular vision from non-specific cause or condition.

Ametropia — Describes the group of eye conditions (including myopia, hyperopia, astigmatism, etc) which results in the image of an object failing to fall on the retina when the eye is at rest. It is a refractive error.

Aniridia — Apparent congenital absence of an iris.

Aniseikonia — A condition in which the ocular image of an object as seen by one eye differs in size and/or shape from that seen by the other eye.

Anisometropia — A condition in which there is a pronounced difference in the refractive power of the two eyes, e.g. one eye may be myopic, the other hyperopic. If the variation is pronounced, binocular vision will be affected.

Anophthalmos — Congenital absence of the eyeball. This term may also apply to enucleation (surgical removal of the eyeball).

Anterior Chamber — The space in the front of the eyeball bounded by the cornea in front and the iris behind, and filled with aqueous humour.

Aphakia — Absence of the lens of the eye either congenitally or through surgery.

Aqueous Humour — A clear, watery fluid manufactured by the ciliary body, which occupies both the anterior and posterior chambers of the front section of the eye (between the cornea and the lens).

Asthenopia — Eye fatigue, affecting the eye muscles.

Astigmatism — A common defect affecting the curvature of the refractive surface of the eye, which prevents the light rays from coming to a single focus point on the retina, resulting in the formation of a distorted image.

Atrophy — A wasting or diminution in size of a part of the seeing system, caused by lack of nourishment, incidental to development, accident, or lack of use.

Bilateral — Involving both eyes, left and right.

Binocular Vision — The use of the two eyes simultaneously and equally to focus and fuse the two images thus received into one, giving the object viewed its true interpretation and position in space.

Blind Spot — The area on the retina, not sensitive to light, where the optic nerve enters the eyeball, situated slightly off-centre and away from the macula.

Blindness — For educational purposes, in New Zealand, a person with acuity at C.F. or P.L. levels (when any enlargement of print is of no use), without usable residual vision (either central or peripheral) would be educated as a blind person. For legal purposes, this criteria is reduced to 6/60 acuity, or a field restriction to 20°.

Canal of Schlemm — The circular canal, sited at the junction of the sclera and cornea, through which the aqueous humour passes after it has circulated throughout the anterior and posterior chambers. Pressure in this part of the eye is thus maintained.

Cataract — Cloudiness, opacity or loss of transparency of the lens and/or its capsule. This obstructs the passage of light rays to the retina, and thus diminishes vision. Over exposure to heat, x-rays or radiation, an injury, or a disease (such as diabetes) may cause cataracts. One or both eyes may be affected.

Central Vision Acuity — The ability of the eye to perceive the shape of objects in the direct line of vision.

Choroid — The brown membrane, rich in blood vessels and pigment, which lies between the sclera and the retina, lining the greater part of the eyeball. Its purpose is to provide nourishment for the retina, vitreous humour and lens.

Ciliary Body — A circular body composed of muscle and blood vessels, located behind the iris, and is responsible for focussing the lens and the manufacture of aqueous humour.

Coloboma — Congenital cleft (fissure, crack) due to the failure of the eye to complete growth in the part affected. It usually exists as a blind spot or scotoma corresponding to the location of the defective part.

Colour Deficiency — An eye condition in which a person confuses colours. Inability to tell red from green is the most common, although blue-yellow colour blindness also occurs. It is a deficiency, not a disease, more frequently inherited.

Cones and Rods — The two types of cells which form the layer of the retina that receive the light rays. Cones provide day-time acuity and colour discrimination, while rods monitor movement and low illumination situations (night vision).

Congenital — Existing at, or prior to birth.

Contact Lenses — Lenses manufactured to fit directly onto the eyeball, held in place by surface tension. They tend to be less distortive than conventional glasses, though a little fussy to fit and remove, and can be accidentally dislodged all too easily.

Convergence — Eyes turned in towards the nose, normal for viewing objects at a very close distance.

Cornea — The "window of the eye", it is the curved, clear, outer portion of the front section of the eyeball, through which light rays enter the eye.

Count Fingers (C.F.) — A method of reporting vision too low to read the Snellen Chart, by recording the maximum distance at which the number of fingers can be counted.

Crystalline Lens — The natural lens of the eye, situated behind the iris and in line with the pupil. Being colourless and muscularly controlled, its function is to focus the light rays precisely onto the retina, providing a clear image.

Diplopia — Double vision.

Dislocation of the Lens — The lens is not in its normal position. The condition is caused by a defect in the suspensory ligament and results in difficulties with accommodation which in turn affects the lens's ability to focus properly.

Dyslexia — A learning disorder incorrectly blamed on poor vision. It affects the ability to read accurately.

Emmetropia — The normal condition of the eye in respect to refraction and accommodation, giving a clearly focussed image on the retina.

Entropion — An eyelid that turns inwards.

Enucleation — Surgical removal of the eyeball.

Epiphora — Excess formation of tears.

Esotropia — Convergent strabismus, crossed eyes.

Exophthalmos — An abnormally protruding eyeball.

Exotropia — Divergent strabismus.

Eye Dominance — The tendency for one eye to assume the major function of seeing, being assisted by the less dominant eye.

Farsightedness — See hyperopia.

Field of Vision — The space within which an object can be seen while the eye remains fixed upon one (central) point, including the limits of peripheral or indirect vision. (*Figure 1*).

Focus — The point to which light rays are converged after passing through the lens.

Fovea — A small depression in the centre of the macula, it is the most sensitive part of the retina. Together with the macula, it forms the part of the retina on which the light rays focus to give a clear, sharp image.

Fundus — The general area at the back of the eye.

Fusion — The co-ordination of the separate images formed on the retinas of the two eyes into a single mental image.

Glaucoma — Abnormally high fluid pressure within the eye caused by poor drainage of aqueous humour from the eyeball.

Glioma — Malignant tumour of the retina.

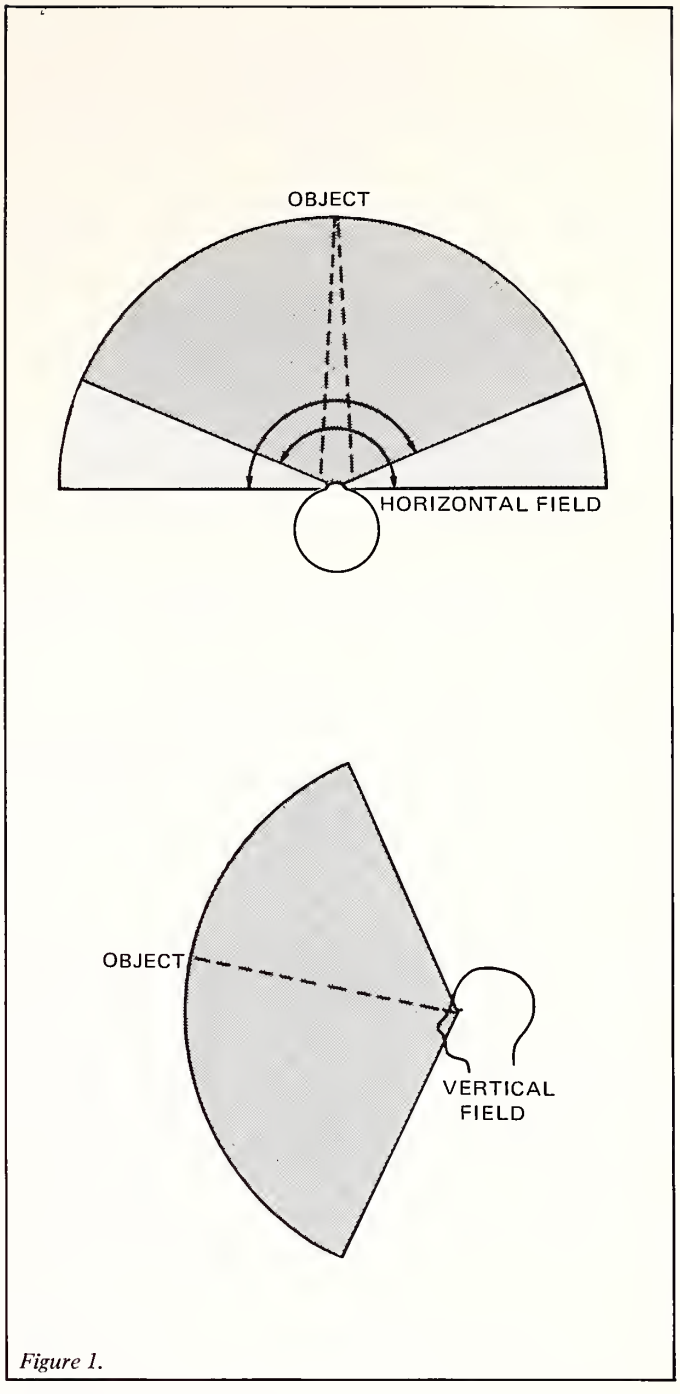


Figure 1.

Visual Fields are shown in these two diagrams. The vertical range of the eyes (above) is about 140°, and is bounded above by the brows and below by the cheeks. The horizontal scan (below) is approximately 180° when the eyes are focussed on a fixed object (dotted lines). Each eye has a range of about 150°. as shown by the arrows. Where the fields of vision overlap (centre section), binocular sight occurs.

Hand Movements (H.M.) — A method of reporting vision too low to count fingers, by recording the maximum distance at which movement of the hand can be seen.

Hemianopia — Blindness of one half of the field of vision of one or both eyes.

Heterotropia — Covers conditions of strabismus (including esotropia, exotropia, hypertropia, etc).

Hyperopia (Hypermetropia, Farsightedness) — A foreshortened eyeball causing the focal point of the light rays to fall behind the retina.

Hypertropia — One eyeball deviating upwards.

Iris — The thin, coloured, disc-like diaphragm, perforated by the pupil, which regulates the amount of light entering the eye by changing the size of the pupil. It is suspended behind the cornea and immediately in front of the lens.

Ishihara Colour Plates — A series of multi-coloured charts used as a test for colour blindness, or defects in colour recognition.

Jaeger Test — Lines of reading matter printed in a variety of sizes of type, used as a test of near vision.

Keratoconus — Cone-shaped deformity of the cornea.

Lens — See crystalline lens.

Light Perception (L.P.) — A method of reporting vision

Low Vision Aids — A variety of devices employed by people with visual impairment to improve visual functioning.

Macrophthalmos — An abnormally large eyeball.

Macula — The small part of the retina surrounding the fovea. Together with the fovea, it is the area of clearest vision, used in fixing, analyzing and reading activities.

Microphthalmos — An abnormally small eyeball.

Muscle Imbalance — See strabismus.

Myopia (Nearsightedness) — An elongated eyeball causing the focal point of the light rays to fall short of the retina.

Near Vision — The ability to perceive clearly objects at normal reading distance (25-40cm).

Night Blindness — An inability to see at night or in poor illumination.

Nystagmus — A rapid involuntary movement of the eyeball. Movement can be horizontal, vertical, roving or rotary.

Oculist — See ophthalmologist.

Oculus Dexter (O.D.) — Right eye.

Oculus Sinister (O.S.) — Left eye.

Oculus Uterque (O.U.) — Both eyes.

Ophthalmologist (Oculist) — A physician who specializes in the diagnosis and treatment of defects and diseases of the eye, performs surgery when necessary, prescribes treatment and/or glasses.

Optic Atrophy — Degeneration of the optic nerve tissue, which transports the messages from the retina to the brain.

Optic Disc — The head of the optic nerve in the eyeball.

Optician — A technician who manufactures glasses and other low vision aids to a prescription.

Optic Nerve — The nerve which conveys the impulse messages from the retina to the brain.

Optometrist — A person qualified to carry out sight testing, including checking the motor co-ordination of the eyes, and, where indicated, to prescribe spectacles or contact lenses to correct refractive errors and those anomalies of binocular function which are amenable to optical correction.

Orthoptist — Non-medical technical person who provides scientifically planned exercises for developing or restoring the normal teamwork of the eye system.

Partial Sight — For educational purposes, vision which has an acuity of 6/24 or less in the better eye after the best possible correction and where vision is used as the chief channel of learning.

Peripheral Vision — This occurs when the images fall on the part of the retina away from the fovea; the ability to perceive the presence, motion and colour of objects outside the direct line of vision. Such vision is indistinct, but is of great importance for our guidance and safety in mobility.

Photophobia — Abnormal sensitivity to light.

Posterior Chamber — The space between the back of the iris and the front of the lens, filled with aqueous humour.

Presbyopia — A decrease in the ability to accommodate, more noticeable after the age of about 40.

Prosthesis — Visually speaking, an artificial eye.

Ptosis — A drooping upper eyelid, due principally to paralysis.

Pupil — The "black" round hole in the centre of the iris which permits light rays to enter the eyeball.

Refraction — The process of bending the light rays so that they fall onto the retina.

Refractive Error — A defect in the eye which prevents the light rays from being brought to a single focus exactly on the retina.

Refractive Media — The clear parts of the eye having refractive power, namely the cornea, aqueous humour, lens and vitreous humour.

Retina — The inner coating of the eye which receives the images on the rods and cones, changing them into nerve impulses which are transmitted to the brain through the optic nerve.

Retinal Detachment — The separation of the retina from the choroid.

Retinitis Pigmentosa — An hereditary degeneration and atrophy of the retina, characterized by misplaced pigment, progressively decreasing fields of vision and night blindness.

Retinoblastoma — A malignant tumour of the retina.

Retrolental Fibroplasia (RLF) — A disease of the retina occurring most frequently in prematurely born infants of low birth weight who receive excessive oxygen.

Sclera — The tough, white outer covering of the eyeball in which is set the clear section of the cornea.

Scotoma — A blind or partially blind area in the visual field caused by retinal scarring in most instances.

Snellen Chart — A chart for testing distance central visual acuity. Letters or symbols are drawn to a measured scale in such a way that a normal eye sees the largest at 60m and the smallest at 4m. The measure of a person's visual acuity is given by the fraction indicating the smallest row he is able to read at a given distance. *Figure 2.*

Stereoscopic Vision — The ability to perceive the relative position of objects in space without such clues as shadow, size and overlapping.

Strabismus — Muscle imbalance, squint, crossed eyes — the failure of the two eyes to simultaneously direct their gaze at the same object, and work in unison.

Suppression — Ignoring one of the two images which appear as a result of a squint (double vision). Central vision decreases through non-use. Amblyopia is usually diagnosed.

Suspensory Ligaments of the Lens — The very fine fibres attaching the lens to the ciliary body. Together with the ciliary muscle, these fibres can alter the thickness of the lens to facilitate accommodation.

Toxoplasmosis — A disease, caused by a parasite, resulting in a permanent loss of central vision through retinal scarring.

Trachoma — A viral infection resulting in severe scarring of the eyelids and cornea.

Tunnel Vision — Gun-barrel vision, tubular vision — a contraction of the visual field to such an extent that only a small area of central visual acuity remains.

Uvea — A collective name for the iris, ciliary body and choroid.

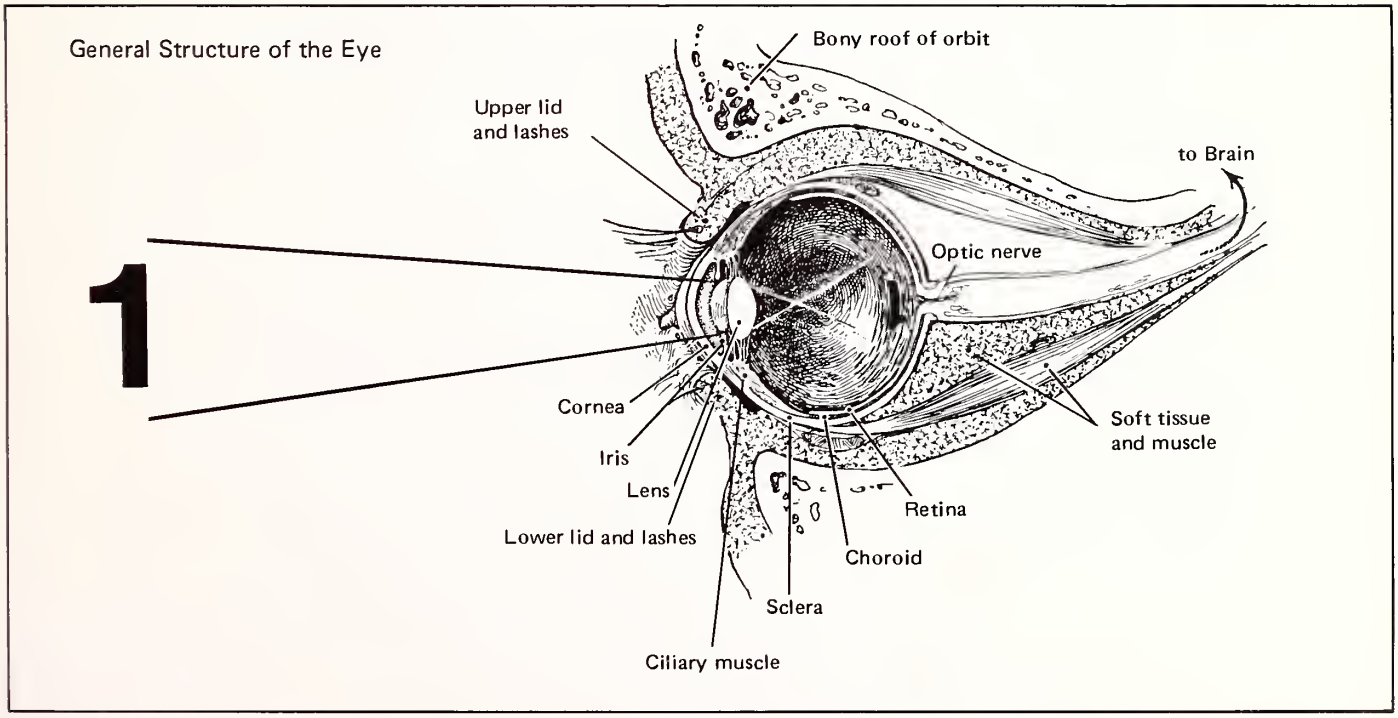
Vision — The ability to see.

Visual Acuity — A measurement of the ability of the ocular system to distinguish detail.

Vitreous Humour — The transparent, jelly-like fluid which fills the space behind the lens, and helps maintain the shape of the eyeball.

Figure 2.

THE FAMILIAR EYE CHART, reproduced here at one-quarter its actual size, was devised by the Dutch ophthalmologist Herman Snellen in 1862, and is still the most common means of testing distance acuity. The subject stands 6 metres from the chart and reads as many letters as he can. If he can corectly read all the letters in the first seven lines, his distance acuity is considered normal, or 6/6. If he can read more than seven lines, he has exceptional acuity; less than seven may indicate a need for eye-glasses. For an informal acuity test, prop this page and measure off 6 metres. From that distance,a person with 6/6 vision should be able to read the three letters of line 3.



AGE GROUP 7-8 YEARS

N5

The two boys go for a walk by the water. There are many trees by the side of the water, and the boys can see lots of nests in the trees. The birds fly about in the trees, and then go back to their nests. The birds fly down and look for food for their baby birds, which must have just come out of their eggs. The boys can hear the baby birds making a lot of noise. The boys do not try to look into the nests because the birds may fly away and leave the little birds alone. The boys know they must not go into nests.

N6

The little girl plays in the garden. It is hot to-day. She likes to play with water on a hot day. She plays in the garden with her toys and the dog. She puts some water on the dog and they get very wet. The dog runs about, all round the garden, and soon he is dry. The little girl, whose name is Anne, runs round after the dog, and soon her clothes are dry also. Then she makes the dog sit down, and she puts the toys next to him. With a pencil, she tries to draw a picture of the dog on a sheet of paper, but the dog will not sit still.

N8

The boy and the girl see an old mill by the water. The waterwheel works the mill. They like to go to the woods for a picnic tea. It is nice by the trees and not too hot there. As they sit just in the woods, by the water, a small boat goes by. In it there is a fisherman and his dog. The man says that there does not seem to be any fish in the water today. The water takes him slowly along, and as the children watch, he still does not get any fish.

N10

The children go out in the car with their Mummy and Daddy. They go off to the farm. They see some cows and horses by the trees. They play with the sheep dog in the woods, and then have a picnic. The children eat cakes, and drink milk. They sit for some time, and Daddy reads to them from a book.

N12

The teacher tells the children she wants all of them to make one very big picture. It will be a picture of the things they did on their holidays. They will all work on the one picture. Every boy and girl will do some of it. The children get their pot of paint to make the picture. They have red, blue, yellow, green and orange paint for the picture.

N14

The children go on a pier at the seaside. They see a fast motor boat there. Their Mummy and Daddy take them for a ride out to sea, in the fast motor boat. There is a café on the pier, and they all go into it to get some ice cream.

N18

The boy and his sister go on holiday. They go away to the seaside. Friends of theirs go with them to the sea. On holiday they play on the sands, and they ride on some donkeys by the sea.

N24

The brother and sister walked to a farm. They see pigs, cows and horses there. There are rabbits and a dog at the farm. The children have a friend at the farm.

N36

On the way they pass some tall trees.

N48

They go out in a fast motor boat.

INTRODUCTION

It is hoped that you, as a reader of this book, will take an hour or so to read it right through, to familiarize yourself with its contents and layout. You may not currently be involved with the education of a visually impaired child, but the principles explained within these covers will hopefully prepare you for that eventuality. One or two of the comments may assist you in providing a more suitable programme for a pupil who may be performing below his assessed potential, and the ideas expressed in Chapter 4 may alter your approach and attitude to his difficulty and the resulting problems he is experiencing.

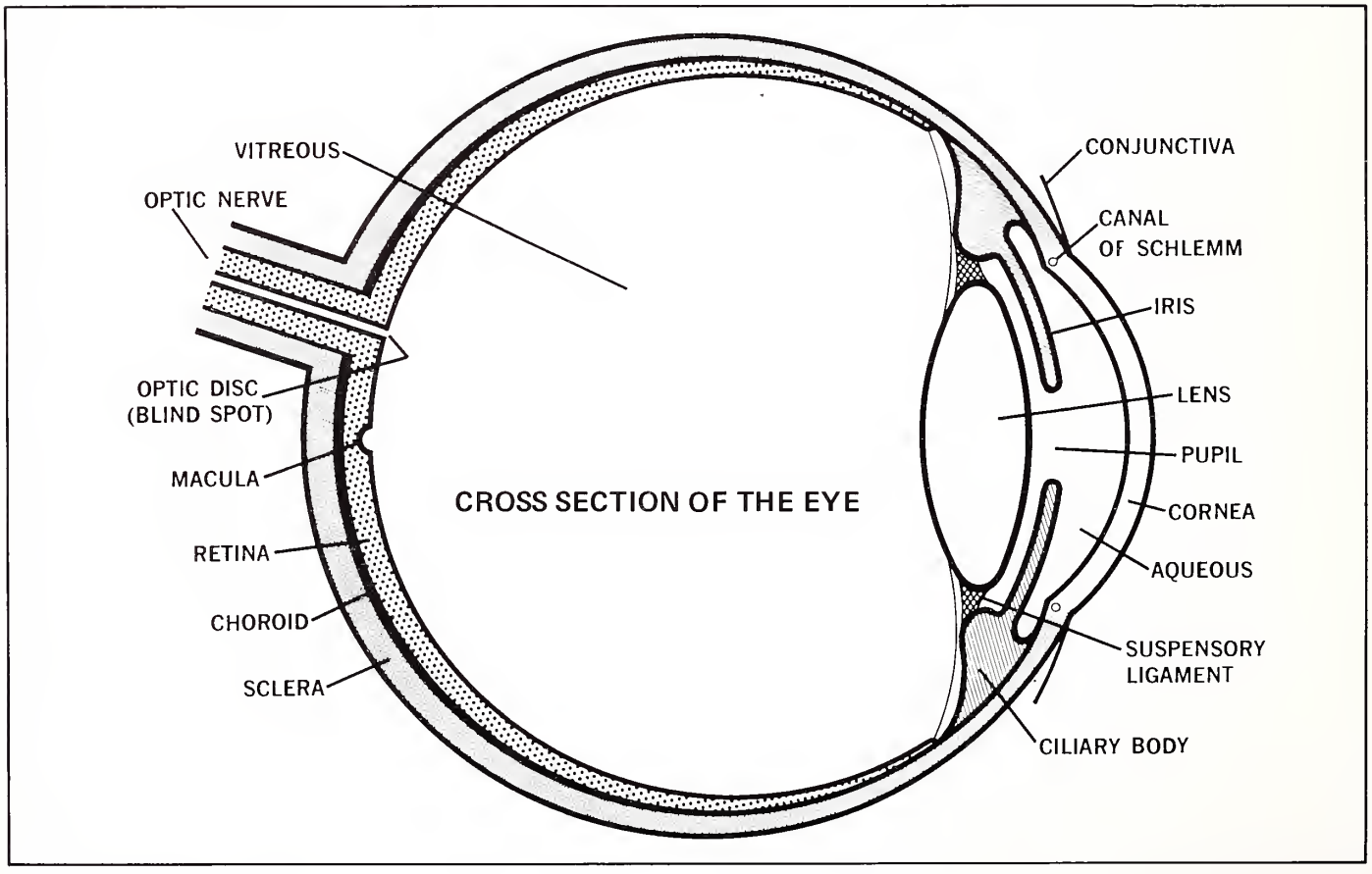
One of your students may be causing some concern for no identified reason, and the screening test for visual dysfunction in Chapter 5 may be considered. If through this testing you identify that the pupil does have something wrong with his vision, then the whole book becomes relevant to you.

Should you have a pupil in your classroom who is sight impaired, again read the book right through and mark the appropriate passages for quick future reference. The book is designed to be used frequently. It is cheap, and therefore, hopefully, readily available when and where you need it. It is short, so as not to present a formidable reading task. It does not spend time in detailing involved investigative studies conducted by scientists, educationalists and psychologists of international repute, but may use the findings of such studies as they apply to teaching techniques associated with particular eye conditions. If you are motivated to follow a particular study in greater depth, for whatever reason, then you are encouraged to do just that.

My book just sets out to answer the questions "What do I do to teach a partially sighted child in my classroom? Am I doing the right thing? Is it wrong to do this or that?" The techniques that are detailed may not be the only answer, but in my experience, they have invariably (i) provided the type of support a teacher seeks at the time, and (ii) been the starting point from which further experimentation and adaptation may grow.

Specific cases of children are mentioned (with changed names of course) only as they tend to illustrate the matter under discussion, but it is inevitable in a country as small as New Zealand, that the teachers associated with these students may recognize themselves and the pupil. No embarrassment is intended.

It is estimated that upward of 80% of those identified as having a visual impairment possess usable vision (inferring that less than 20% can be deemed as being "totally blind"). It is up to all of us to see that we give adequate time and effort to attend to the specialized needs in education, to teach the low-vision student to "look" and "see" and to see that full use is made of the remaining vision for functional purposes and day-by-day living. It is acknowledged that it is more difficult to both teach and function as a visually impaired person than it is to educate and exist as a totally blind one. The learning or work required to utilize low vision with true efficiency is not easy, and progress is often painfully slow. Yet the end result can be very satisfying, once it is achieved.



CHAPTER 1

THE NORMAL EYE — HOW THE EYE SEES

The eye, in reality, is an extension of the brain to the forward part of the head to facilitate the sense of sight. It accomplishes this by allowing the light rays to penetrate the eyeball and focus on the back wall where they are converted to electrical impulses. The electronic pattern is sent from the eye to the brain by means of a cable-like bundle of conductors known as the optic nerve. The impulses travel to the lower back portion of the brain, the cortex, where they are translated into conscious vision. There are three stages involved in this system, the eyeball, the optic nerve and the brain, and all parts in the system must function properly for normal vision to occur.

To explain how the various parts function and interrelate, we can follow through this system starting from the external, visible parts of the eye. Only the essential portion of the eyeball for light reception is left exposed. The rest of the structure is housed in a bony cage, called the orbit, for protection. In the orbit itself are the several muscles, nerves and soft tissues which move the eyeball and cushion it. Each eyeball is fastened into the orbit by the set of 6 muscles which move it, and by the optic nerve. The eyeball cannot be removed from the orbit without severing the muscles.

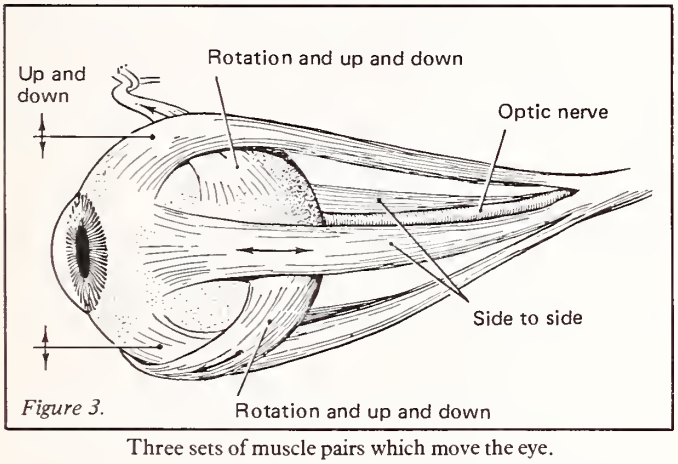


Figure 3.

Three sets of muscle pairs which move the eye.

The eye records only objects which are reflecting light rays, so for vision to occur there must be illumination. In complete darkness there is no vision. The exposed portion of the eyeball is the cornea, the "window" through which the light rays are received. This area is cleaned by the eyelids, with their lashes, which act like windscreen wipers clearing dust particles away and smearing moisture over the cornea. The lashes act as a dust screen in windy and dusty conditions. The reflex action of blinking every 2 — 10 seconds ensures eye protection against damage from flying grit and insects, excessive light, impactive blows to the region of the eye and dryness of the eyeball. Tears continually wash and moisten the area, particularly if irritation occurs from fumes, vapours, or small particles. Tears contain salts as well as antiseptic substances to combat infection.

Covering the cornea and extending out to line the inside of the eyelids is a thin, transparent tissue called the conjunctiva. This membrane makes a very effective, flexible seal between the external and internal sections of the eye. It contains fine blood vessels which are usually closed, but which open up when irritation or infection occurs, causing a "blood-shot" eye.

The eyeball would be a perfectly round 2.5cm diameter ball, were it not for a bulge in the front — the cornea. This is a clear portion of the sclera, the tough, white, fibrous coating of the eyeball called the "white" of your eye. These tough fibres help to give the eye its shape and form, by forming the outer container of the aqueous and vitreous humour.

Immediately behind the cornea is the coloured iris, which regulates the amount of light entering the eye by changing the size of the pupil. Acting somewhat like the aperture of a camera, the pupil dilates in dull light, and contracts in bright light by reflex action, thus regulating the ability to see without discomfort.

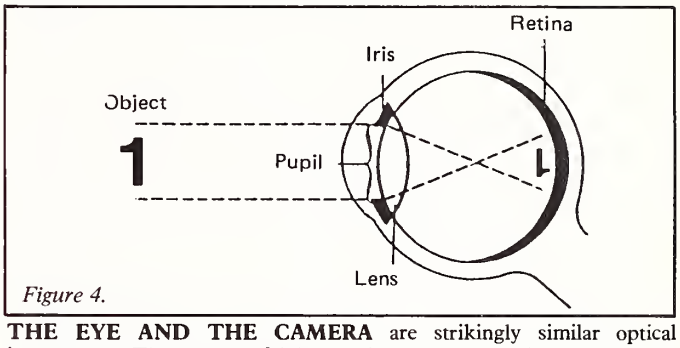


Figure 4.

THE EYE AND THE CAMERA are strikingly similar optical instruments. The amount of light entering the eye (above) is controlled by the circular iris, whose muscle fibres regulate the opening of a window called the pupil. The cornea and lens focus an inverted image on the retina. The camera (below) also has an adjustable iris diaphragm to govern the amount of light entering through the aperture, and a lens for focusing the image on the film. However, the camera's lens must be moved forwards or backwards for every change of focus; the eye's stationary lens changes its shape to achieve a sharp image.

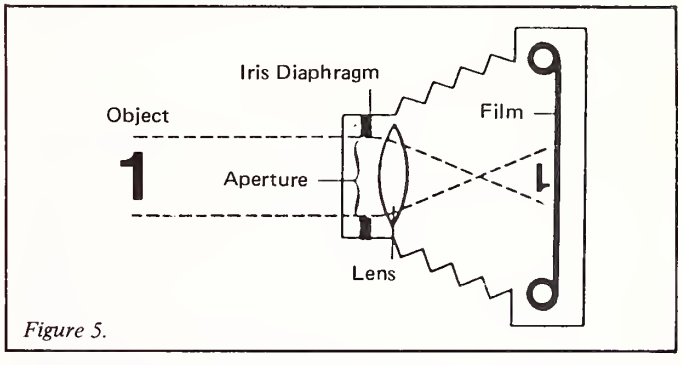


Figure 5.

Placed centrally behind the pupil is the lens. Its prime function is to focus the light rays on to the retina at the back of the eyeball. Light rays from a distant object require only a minimum amount of focussing. To accomplish this, the lens is stretched thin by the ciliary muscle. Divergent light rays from a near object require more effort to focus. The ciliary muscle relaxes the suspensory ligament, so that the lens fattens to project the rays clearly on the retina. As a person gets older, the lens becomes less flexible, and some focussing power is lost. This ability to focus automatically is called accommodation.

Two tissue layers line the back three-quarters of the eyeball, the choroid and the retina. The function of the

choroid is to nourish the retina. The retina is the light-sensitive layer of the eye which contains the actual receptors of the light rays — 120 million rods and 6 million cones. Only a small specialized part of the retina, called the macula, is capable of receiving sharp images. When you are looking at an object, the muscles align the eyes so that the macula in each eye is pointed directly at the object. The remainder of the retina, away from the macula, is useful for only coarse interpretation. This is why you turn your eye to see better an object that is already within your field of vision.

When light strikes the rods and cones in the retina, chemical changes occur. The cones contain violet pigment and the rods purple pigment. These pigments are bleached by light, which in turn stimulates nerve signals that travel along the optic nerve to the brain. The cone pigment bleaches at a slower rate than the rods; as a result, cones work more effectively in strong light and are essential for day vision. Rods become more effective in dim light, or at night time when they can detect faint light sources. The cones increase in concentration towards the back of the retina, until in the area of the macula there are no rods at all, only cones. In the area of the fovea and macula, each cone is connected to a single nerve fibre, while at other parts of the retina groups of 100 rods and cones feed impulses into a single nerve fibre, producing a much less precise image.

Each nerve fibre exits from the eyeball via the optic nerve. There are no visual receptors at this point, so it is not sensitive to light. Being about the size of a match-head, it is known as the "blind-spot", and occurs in the field of peripheral vision, away from the macula.

The optic nerve is responsible for transporting the nerve impulses from the retina to the visual centre at the back of the brain. The optic chiasma is a junction of nerve fibres from both optic nerves. Here, about 50% of the fibres cross over, so that impules from each retina reach both sides of the back of the brain. Nerves from the outer sides of the retinas travel to the same side of the brain, but nerves from the inner sides cross over at the optic chiasma, and pass to the opposite side of the brain. The visual centre at the back of the brain receives the nerve impulses and begins the process of interpreting and storing visual impressions. Whereas the retina receives an upside-down image, the brain turns it right side up.

While the eye is a very adaptive organ, it needs the brain to organize visual experience. The brain controls the direction in which the eyes are aimed by activating the external eye muscles. The eye cannot take in a scene or object at one glance, but rather sees it as a rapid succession of images. These images are blended by the brain to give continuous vision. Nor can the eyes see a complete 360° all at once, only what lies directly in front. The brain has to fill in the reality of the world that exists behind us. Under instruction from the brain, the eyes can select important details and eliminate irrelevant ones. But the role of the brain is not only to receive images and adjust the eyes to changes in the surroundings. It must also store and assess impressions into visual memory. Eyes and brain work together to analyse information constantly, and make comparisons with past experiences. Once an object has been "seen" in this way, all its qualities (texture, size, shape, colour, weight, etc) are immediately recalled when it is seen again. This ability to memorize object qualities is assisted by the other senses.

Congenital abnormalities, disease, accident or injury to any part of the visual system will result in impaired vision. If the impairment has occurred at birth (or prior to it), or very early in life, the mental imagery will be correspondingly affected and inaccurate. There is a growing practice of prescribing glasses and aids at a very early age so that correctable anomalies of vision are not allowed to interfere with the normal process of visual and perceptual development, so important in the accumulation of accurate mental imagery.

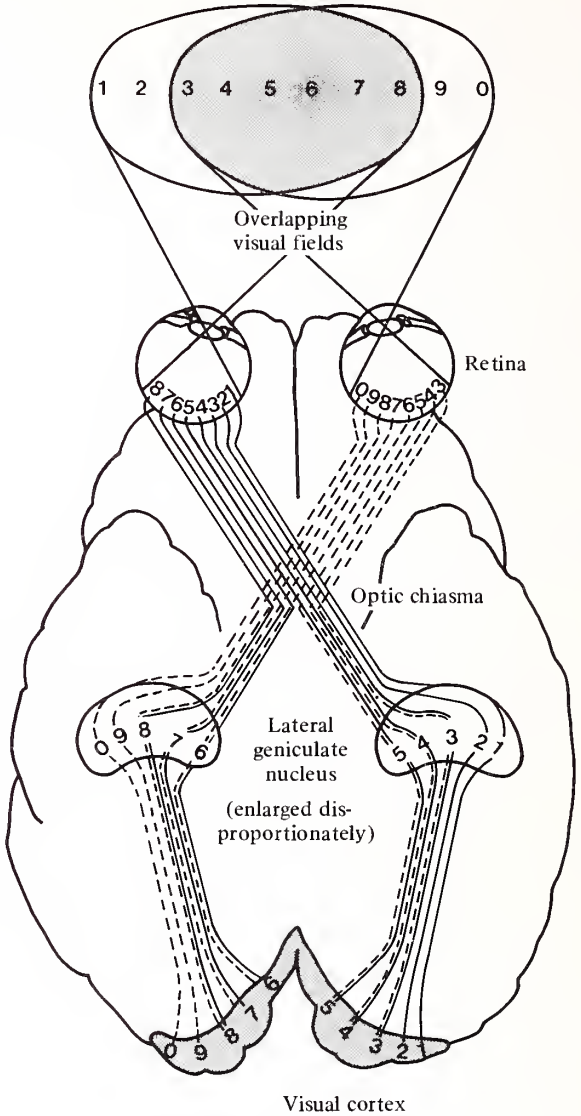


Figure 6.

THE CROSS-OVER of visual nerve fibres results in the left part of the brain "seeing" only the right half of the field of vision, while the right part "sees" only the left half. The retina of each eye receives the entire image of an object, as shown by the solid and dotted lines passing through the lenses. Impulses generated by the images on the retinas are carried from the eyes by the optic nerves. However, at the chiasma, the fibres in each optic nerve divide into two bundles. The inner branch from the right eye (dotted line) crosses over and joins with the outer branch from the left eye (solid black line) before continuing to the left lateral geniculate body. The other branches are routed to the right lateral geniculate body. Both sets of fibres are then relayed in newly formed nerve bundles to terminals on either side of the visual cortex.

DEVELOPMENT OF THE EYE FROM BIRTH TO 8 YEARS OF AGE.

During the first 5 years of life, the visual development of a normal child follows an observable pattern. Specific visual milestones may appear early or late, or reappear from time to time before finally becoming stable. Variety and intensity of the visual stimulation of the baby is an important factor in this natural development. The neural system, including the optic nerve, is immature in early infancy, and the peripheral area of vision tends to mature earlier than the macular area of the retina. Hence, movement and gross form attract a baby's attention more readily. However, through stimulation, the infant becomes more and more aware of visual sensations, and he begins to process a greater variety of visual information.

At birth, things are not in focus because the ciliary muscles are generally weak, so fixation is difficult to control. Light, and particularly bright light, provides the greatest visual response at this stage, indicating that the retina and optic nerve are at least capable of stimulation.

Within a few months, the baby is able to track a slowly moving object at 1m distance with reasonably smooth eye movements. Once binocular vision is controlled, the eyes can follow a moving person. Accommodation development allows moving objects to be followed at about 3-4m distance. Reaching towards objects indicates the development of discrimination and environmental interpretation, together with some degree of depth perception. Very soon, accommodation to view objects as close as 10cm away is accomplished, and much time is now spent in "looking". The improving muscular control of the eye-ball is indicated by extended gaze time, and scanning and tracking activity.

Eye-hand co-ordination also improves as smaller objects are picked up and brought closer to the eyes for more detailed visual examination. Binocular vision and colour discrimination also improve. Accommodation development now allows sharper focussing for near and far objects. Accurate aim in reaching for an object, looking from one object to another, and turning the head when dropping an article indicate improvements in the visual-motor co-ordination and muscular control.

Looking and seeing now becomes part of movement and action. The ability to accommodate more quickly is observed. The child is now more aware of objects in a special relationship, or their position in relationship to each other, as his visual perception becomes integrated with his social and cognitive development. Visual memory is more meaningful to him, and familiar objects frequently bring a smile or sign of recognition.

Visual games like building 2-block towers can now be accomplished successfully, and visual copying is now at its most active phase. Experimentation with toys, puzzles, books and pictures increases rapidly from here on.

Visual perception, enhanced by all the other senses, now develops for what has been, up until now, a principally muscular control of eye movement, accommodation and focussing skills. Visual memory is embellished by tactile exploration, tasting and smelling, assessing variations in size and texture, weight, etc.

Individual variations in the maturation of different visual capabilities is great. Most newborn infants can fix their gaze on, and follow an object when it is slowly moved horizontally. The tracking movements of the newborn are jerky, but start to resemble smooth pursuit movements at the age of 2 months. Visual acuity of the newborn is only about 2/60 but improves rapidly. At the age of 3 months it is about 6/60, and at the age of 6 months it is close to adult visual acuity levels. The basic neural mechanisms of binocular single-vision are present at birth, and stereopsis (depth perception) is documented to be present as early as 2 months of age. Rapid visual development between the ages of 3 & 4 requires only a cursory visual exploration to identify things in their entirety. By 4, he controls eye-hand co-ordination and exercises visual control for exploration and manipulation. At 5, he is able to discriminate, recognize and perceive like and unlike abstract figures such as letter and number symbols and complex designs. He still tends to be slightly short-sighted, so the larger the symbols and designs, the easier they are to interpret. The size of his copies of these symbols indicates the level of development of his eye-hand (or visual-motor) co-ordination.

Different parts of the sight system reach maturity at different ages. The eyeball at birth is larger in relation to the rest of the body than it is after the age of 8 years when it usually reaches its ultimate size. This would make the eye quite farsighted were it not for the greater curvature of the lens during infancy. The lens at birth is more spherical in shape than later in life, and more like a soft plastic in consistency. The lens grows throughout life as new fibres are added to the outer surface, making it flatter in shape and of a glass-like consistency.

The newborn infant has a relatively large cornea which reaches adult proportions by the age of 2 years. It is flatter than the mature cornea with a more pronounced curvature round the outer edges. This shape reverses in adults. Tear secretion over the cornea begins after the first few weeks of life.

The iris at birth has little or no pigment on its visible surface, but the pigment layer underneath shows through as a deep blue colour. As the pigment moves to the outer surface, so the colour of the iris emerges — the more pigment deposited, the darker brown the iris becomes. Lesser deposits result in blue, hazel or green eyes.

The normally slow development of reflex action may result in eye movements being poorly co-ordinated during the first three months of life, thus giving rise to concern that a baby's eyes are not straight. Most of the binocular reflexes should be well developed by 6 months of age, and any abnormalities after this age should be checked out.

About 80% of children are born farsighted, 5% shortsighted, and 15% emmetropic (normal). Farsightedness increases until about 7 or 8 years of age when the eye reaches its full size, then gradually decreases until about 19-20 years of age. After 7-8 years of age myopia (nearsightedness) gradually increases until about the age of 25. Hyperopia (farsightedness) decreases less than myopia increases. There is usually little change in refractive error during the 3rd and 4th decade.

CHAPTER 2

EYE CONDITIONS EXPLAINED

ALBINISM.

Albinism is a congenital condition characterized by a very fair complexion, white hair and lack of colour pigment in the iris. It is due to an inability of the body to produce colour pigment. It may involve all the pigment structures — hair, skin and eyes — or, if the condition is incomplete, the deficiency of pigment is in some structures only. Carriers of this hereditary condition may exhibit minor forms of albinism.

An albino child is usually sensitive to light (photophobic), have nystagmus (involuntary eye "wobble"), may squint or have peculiar facial expressions in an effort to block out excessive light, He may also have difficulty in focussing. Glasses do not improve his acuity (assuming that albinism is his **only** condition), but tinted glasses can ease the problem of light sensitivity. Lighting conditions would therefore be very important to albinos, both indoors and out. Albinos frequently have very high refractive errors and may exhibit high amounts of astigmatism, though visual fields are generally normal if there are no other ocular conditions present.

The eye specialist, in examining the eye, will notice that the normally coloured iris is tinted pink when light is reflected from the back portion of the eye; he will also note that the choroidal blood vessels — in most normal individuals a pigmented barrier prevents these vessels from being seen directly — can be observed quite easily.

Treatment of the condition may involve the fitting of contact lenses, with a "pin-hole" type of pupil to reduce the glare problem, and providing an optical correction for the refractive error. This combination often reduces the nystagmus somewhat, coupled with the physical effect of having a lens on the eye.

Because there is no pigmentation in the skin, he will tend to sun-burn very easily. Hats, full sleeves and long trousers should be worn on sunny days when out-of-doors for any length of time.

Teachers may observe that albino children may run to extremes in personality, possibly because they are very conscious of their different appearance. Most often they tend to be clean, neat, well organized and personally immaculate, even annoyingly fastidious in their efforts to be tidy. Because of their intolerance to light, it may be best for the teacher to allow the student to select the area of the room best suited to his needs, and permit experimentation with variations in sunny/cloudy conditions, morning or afternoon use of the same room, use of screens, strip lighting with a "dimmer" control, and diffused lighting. He should still have access to clear, black print, well spaced on non-glossy paper for all reading tasks.

Perhaps more importantly, encourage his acceptance into the class group as "one of your pupils" — it enhances his self-image, reduces the stresses and tensions that adversely effect the nystagmic condition, and gives him a better chance to perform visually at a level commensurate with his ability. Be aware that the mobility skills and performance will relate directly to light intensity at the time, and be compounded by the level of visual acuity of the individual child. Because of the hereditary nature of this condition, genetic counselling may be advisable before the student leaves school.

AMBLYOPIA (EX ANOPSIA)

Amblyopia is dimness of vision or partial loss of sight, with no apparent impairment of the structures of the eye or the optic nerve. Abnormal binocular functions will develop if for some reason the pictures of the two eyes cannot be fused to form a single image. If the refraction of the two eyes are different, focussing will only enable the image of one eye to be clear, and either the child learns to look with each eye separately (alternate fixation), or he uses only one eye, involuntarily suppressing the image seen by the other eye. When one eye is strongly preferred, the cortical function related to the other non-dominant eye develops poorly, and the otherwise normal eye becomes functionally amblyopic. If the sensory input to this poorer eye can be improved by spectacles, patching the good eye, or by surgery, the visual acuity of this non-dominant eye may improve to normal. Most of this improvement must take place before the age of 9, at which age the cortical functions become relatively fixed.

ANIRIDIA

Aniridia is a developmental defect which is inherited. Sufferers of this condition appear to have an enormous black pupil and no iris. Ophthalmic observation shows that the iris has failed to develop properly, and that the muscles which open and close the iris diaphragm are entirely missing, leaving the iris tissue as a thick collar around its outer edge, much like a rolled-up circular-shaped blind without cords to let it down.

Like so many developmental defects, aniridia is often associated with additional flaws — nystagmus is very common, cataracts may occur, glaucoma may also be present, together with under-development of the fovea which would affect the area of central vision. Except in a few cases, aniridia effects both eyes, but visual loss is attributed mainly to one or other of the defects which accompany aniridia — sensitivity to light (photophobia), decreased visual acuity, nystagmus, glaucoma, cataracts, dislocation of the lens, under-development of the retina, and in rarer cases, constriction of the visual fields.

Patients with aniridia are often helped with "pin-hole" contact lenses which provide artificial irises and decrease the amount of light reaching the back of the eye. The lenses can also improve the visual acuity and reduce nystagmus. Other low-vision aids such as telescopic and miniscopic devices may also be prescribed to aid the patient's performance for specific visual tasks.

ASTIGMATISM

This is frequently one of the "undetected" eye problems in children, because of the wide range of severity, and because of the general blurrring of images rather than the specific loss of either near or distant vision. There are also many variations in degree and type of astigmatism, the milder cases presenting few or none of the observable abnormal visual behaviour mannerisms.

Astigmatism is an eye defect, usually in the cornea,

which prevents the eye from focussing a clear image on the retina and results in distorted or blurred vision. Astigmatism may be suspected when the child is observed tilting his head to one side when reading, confusing similarly shaped letters or numbers (m/n, t/f, 3/8, etc), complaining of headaches or blurred vision, or exhibiting generally poor visual discrimination which is particularly noticeable in discerning details in maps, column charts, or illustrations.

Most cases of astigmatism are correctable with glasses or contact lenses. In addition, good illumination, clear black print on non-gloss paper, and careful attention to the development of visual skills will assist the astigmatic child to perform his visual tasks without becoming fatigued and frustrated. Preferential seating may also need to be considered.

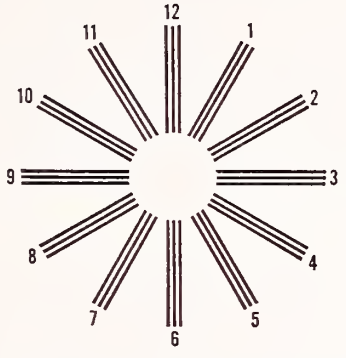


Figure 7.

TESTING FOR ASTIGMATISM is sometimes done with this wheel of numbered lines. Astigmatism is usually caused by an imperfectly formed cornea which distorts the image by refracting light rays to a greater degree in one plane — the vertical or the horizontal, for example — than in another. By noting which lines the subject sees sharply and which are blurred, the examiner receives an indication of the type of astigmatism the subject has.

Figure 8.

This shows the type of test used to discover *Astigmatism*. To the astigmatic eye the circles appear to be of unequal blackness.

CATARACTS

Cataracts develop as opacities of the lens of the eye, which causes blurring of vision. They come in several types, more frequently in elderly people, though some children are born with cataracts or have them develop as an addition to some other condition or disease. Over-exposure to heat, x-rays or nuclear radiation, an eye injury, or a disease such as diabetes may cause cataracts. One or both eyes may be affected. It may be an inherited condition.

Because most cataract conditions can be alleviated by surgery or treatment, children with post-operative cataract conditions may need only temporary classroom adaptations — encouragement to accept and adapt to the prescribed glasses or contact lenses, regular eye examinations, frequent eye-rest periods, eye hygiene, enlarged print if this is necessary, or in some cases, increased illumination. No attempt should be made to change teaching methods or materials until the eye specialist's advice has been sought. Encourage the child to use and develop what vision he has to its maximum efficiency.

There may be good reason why surgical intervention is undesirable in some cases, as in the presence of other ocular disorders, in which case it may be observed that with the maturing of the cataract, usable vision decreases, and the patient becomes increasingly "blind". Special information is needed in these circumstances, and professional help should be sought in both the optical and educational areas.

The effect of untreated congenital cataracts on vision varies greatly from individual to individual, due to the size, position and density of the opacity. Generally, patients with cataracts will experience blurred vision. Visual acuity may range from near normal to almost blind. Nystagmus may occur in severe cases and patients may complain of serious glare problems. Night vision is not generally affected, neither are the visual fields in general terms. Strabismus may develop as the cataract matures, due to the lack of visual stimulation of the affected eye, resulting in amblyopia.

Centrally or posteriorly located cataracts may affect near vision to a greater extent than distant vision. These cataracts are also more of a disadvantage in bright light. Cataracts located at the outer portion of the lens may result in poor colour discrimination, due to the scattering of the light rays around the retina. When the central portion of the lens is affected, dilation of the pupil with drops or ointment allows the patient to view around the opacity, significantly increasing visual acuity. Medication of this type, if used on a regular basis, is an alternative to surgery.

Surgical removal of the lens takes away the patient's ability to accommodate, therefore a bifocal correction is needed for the patient to function at more than just near vision. Glare problems are alleviated by tinting the prescribed lenses.

Since approximately 25% of congenital cataracts are hereditary in nature, these are frequently associated with other congenital abnormalities — rubella syndrome, Down's syndrome, Marfan's syndrome, malnutrition or drug dosage during pregnancy, to name but a few. Genetic counselling may be deemed necessary prior to leaving school.

COLOBOMA

A coloboma is a notch or cleft appearance of the pupil, giving it a characteristic tear-drop shape. Because it is a developmental abnormality, the malformation may extend all the way back to the optic nerve. The location and extent of the condition depends on the stage of development of the foetus when the trouble occurred. It is generally bilateral and may be associated with other conditions like microphthalmia, abnormalities of the head and face, extra fingers and toes, and mental retardation.

If areas of the retina are involved, then there will be a corresponding field loss in that area of vision — a "blind spot". This is generally an upper field loss since most coloboma clefts are in the lower portion of the iris. An affected eye may develop sympathetic strabismus and/or nystagmus, be susceptible to glare or bright conditions due to the additional light entering the eye through the enlarged pupil aperture, or be prone to blurred images. Contact lenses containing a symmetrical iris and tinted glass are frequently fitted for cosmetic reasons, though many patients manage quite well without aids, provided there are not other serious optical conditions.

COLOUR DEFICIENCY

"Colour blindness" is a deficiency rather than a disease. An inherited condition that affects more males than females (though women are frequently identified as carriers of the condition), nothing can be done to correct it. Both eyes are commonly involved. Most colour-deficient individuals are unaware that they have the condition until it is discovered in a test.

Difficulty in distinguishing red from green is the most common type, affecting about 1 male in 25, but is rarer in women (about 3 in 1000). Blue-yellow deficiency is not so prevalent, and total colour blindness (achromotopsia) is extremely rare.

Achromotopsia is due to the malformation of the cone system, the cones being highly concentrated in the macular area of the retina, and results in a decrease of visual acuity, generally to a level of about 6/60. Sufferers are frequently sensitive to bright lights (photophobia) and may also exhibit nystagmus. Both the nystagmus and the photophobia are significantly reduced under dark conditions, thus sunglasses and shades will prove beneficial. These individuals will also learn to compensate for their colour blindness as they mature, associating the correct colour names to the brightness and intensity of the shades of grey or yellow that the colours of red and green appear to be.

Visual fields generally remain normal (in the absence of any other visual abnormalities). Mobility skills are related to the level of visual acuity — near vision is generally less affected than distance.

Since colour plays an increasingly important role in modern education, it is all too frequent that a child may be criticized or penalized for errors that arise from his inability to discriminate colours. Teachers alert to this problem may understand that red pencil underlinings may not be seen, where as black markings are quickly identified; a red ball on green grass is "invisible" to the colour blind pupil; an archery target is seen without the bullseye and some of its rings; there is little difference (other than position) between the red and green traffic lights.

The teacher's approach should be to avoid colour-orientated directives, opting for verbal or "black and white" alternatives, with encouragement to the child to develop his own abilities to differentiate shades of darker/lighter, though colour names will quickly be associated with degrees of shading. Understanding and patience on the part of the teacher will assist the colour blind student to achieve his potential and develop confidence in overcoming the embarrassing situations created by his lack of ability to see colours as we see them. He is then better able to apply himself to learning the tricks that enable him to operate in a colour-orientated world.

DEGENERATIVE MYOPIA

A condition of extreme nearsightedness, afflicted individuals are generally myopic from a very early age and undergo progressive increases in nearsightedness through the adolescent years. This increase in myopia is due to the actual lengthening of the eye which stretches the posterior portion of the eye causing a tendency towards detachment of the retina. The extent to which degeneration may occur cannot always be accurately predicted, and visual acuity may not be correctable with conventional spectacles or contact lenses. Near vision will generally remain unaffected, though it may be impaired in the more advanced stages. The children are often better doing close work without using their glasses. If there is a retinal detachment there will be a corresponding field loss, though such detachments generally occur in the peripheral area and may not cause any great inconvenience.

In the more advanced stages there may be macular involvement resulting in problems with central vision. Since the macula is the portion of the retina we use to look straight ahead with, any impairment of this area is critical. Swelling of the macular area may occur resulting in distortion when viewing an object.

Treatment generally involves the use of low vision aids such as telescopes and miniscopes when vision cannot be adequately corrected by conventional aids. Surgery may be necessary in cases of retinal detachment. There is really very little that can be done to stop the progression of the myopia. Generally such patients will level off in the post-adolescent period, although detachments of the retina may occur later in life. Teachers are advised to seek ophthalmic advice at frequent intervals due to the fact that each individual has his own speed of degeneration, specific areas that are affected, with resultant needs and areas of difficulty. Frequent eye checks are needed to accurately plot the progression of the condition and to up-grade the visual aids to meet any changes that occur.

DIABETES

Diabetes mellitus is one of the leading causes of blindness in the country. It is a systemic condition due to the lack of insulin in the bloodstream resulting in hyperglycemia (high blood sugar levels) and problems in the body's ability to cope with carbohydrates, fats and proteins. This in turn affects many parts of the body including the eyes, kidneys, skin and the circulatory system (heart, blood vessels, etc).

Symptoms experienced by diabetic patients include excessive hunger, excessive thirst, excessive urination, poor wound healing and lethargy. Juvenile diabetics are generally treated with insulin injections and dietary controls. These are generally the most severe cases and most difficult to treat.

Among the earliest signs of diabetes are the general loss of the ability to accommodate (focus the eyes for a near object) and a fluctuating refractive error. The refractive error will usually remain stable if the condition is under control.

The main ocular problems associated with diabetes stem from the blood vessel changes — they seem to "age" much faster than normal. There may be hemorrhaging in the retinal area resulting in the growth of new blood vessels and eventual retinal detachment. The extent of visual impairment may range from unnoticeable to total blindness. Laser beam surgery will sometimes retard the progression by sealing off the hemorrhaging blood vessels, but this is not always successful. Visual acuity will be reduced according to what parts of the retina are affected. In the more advanced stages the patient will show varyng visual field loss due to the retinal detachments and hemorrhaging; there may be loss of colour vision if the macula is affected. Glaucoma may develop as a result of the growth of new blood vessels extending from the back to the front of the eye. Diabetics are also predisposed to cataracts and may require surgery for removal of the lens. This is very difficult due to the poor wound healing capabilities of the patient.

Teachers will mainly be concerned with the necessity of seeing that medication and dietary requirements are

maintained, and referral to other sections of this book so as to meet the visual needs of the pupil, depending on the type and severity of handicap being experienced.

Since diabetes is an inherited condition, genetic counselling may be considered necessary.

DISLOCATED & SUBLUXATED LENSES

A fully developed, healthy lens is extremely difficult to dislodge, except as a result of a very violent blow. The congenital, spontaneously dislocated lens is almost always smaller than normal as a result of under-development prior to birth. If the direction of displacement is forwards, however, a violent reaction will take place and it is then necessary to extract the lens from the eye. In this operation there is a risk of losing some of the vitreous humour, with consequential further deterioration of vision. However this risk is no greater than the certainty of resultant glaucoma which can greatly diminish, and eventually destroy, useful vision.

"Subluxated lenses" is a term used to signify that such lenses are only partially dislocated. This condition is associated with Marfan's syndrome which causes the defective formation of the ligaments which support the lens. Subluxated lenses are usually displaced upwards. The angle off-centre at which the lenses lie within the eye determines the amount of interference with the rays of light entering the eye. The greater the angle, then the greater the distortion of vision. Focussing is difficult and vision is hazy. Frequently cataracts may also develop.

In the case of subluxated lenses as a result of Marfan's syndrome, the lenses dislocate progressively as the child grows taller until they dislocate completely. This period of time can be quite frustrating for the child as his vision is slowly changing over a number of years, but once dislocation is complete, glasses can be prescribed and a return to relatively normal vision can be expected. The dislocated lens may not be removed surgically provided it does not come to rest in such a way as to interfere with the light rays falling onto the retina. Should it lodge inconveniently, then surgical removal is unavoidable.

DOWN'S SYNDROME

Down's syndrome is a congenital condition due to a genetic abnormality. Such individuals have an extra No. 21 chromosome, hence the name "trisomy 21". This condition is also known as "mongolism" due to the facial appearance of the affected individuals. These patients are generally short and squat in stature, with narrow, slanting eyes and a thick protruding tongue. They are generally mentally retarded with an I.Q. in the 20-60 range. Cardiac abnormalities are also present.

Visually, these patients may demonstrate an obvious squint and nystagmus, be highly myopic, and almost half have congenital cataracts. Surgery is not generally performed due to various complications. The level of measurable visual acuity will depend on the above as well as the intelligence level. Many blue-eyed individuals demonstrate Brushfield spots (small white spots on the iris); however these are thought to be of no consequence.

Visual fields and colour vision are usually normal. Distance vision is generally reduced, but near vision may be adequate. Low vision aids such as telescopes to aid distance vision may be useful, although the level of intelligence will be an important factor in determining the success of such aids.

Since the condition is a genetic abnormality, genetic counselling is imperative. It is the most common chromosomal syndrome, much more prevalent in children born to women over the age of 40.

FARSIGHTEDNESS (HYPERMETROPIA)

It is natural for young children to be normally farsighted to some degree during the first 8-10 years of life. This is a developmental phase of the eye and should not be regarded as abnormal. It is primarily for this reason that reading material for primer classes is produced in large, clear, black, well-spaced type, and with an accent on simplicity of detail with regard to illustrations.

Given that the condition of hypermetropia has been diagnosed as abnormal, it will be obvious that the child sees better at distance than he does at near. These days, prescription glasses giving correction can be worn for all close tasks, and it remains for the teacher to ensure that the glasses thus prescribed are worn on all required occasions, and that they are clean, free from scratches and returned to their case when not in use. No special alteration to a normal programme is required in most cases provided that optimum conditions exist; in the rare case where full correction is not possible, enlarged print may be required, or additional magnification in the form of hand-held magnifiers may help the problem.

These children tend to have little difficulty in the sports field, but may perform below expectation when encountering close work for extended periods of time.

Farsightedness is experienced as a result of the eyeball, instead of being nicely rounded so that images fall comfortably on the retina when accommodation occurs for viewing close objects, is foreshortened so that the image focusses behind the retina. Alleviation of the condition can only occur by prescribing the appropriate lens for close work. The problem does not usually occur when viewing distant objects, though some children may experience difficulty in doing even this.

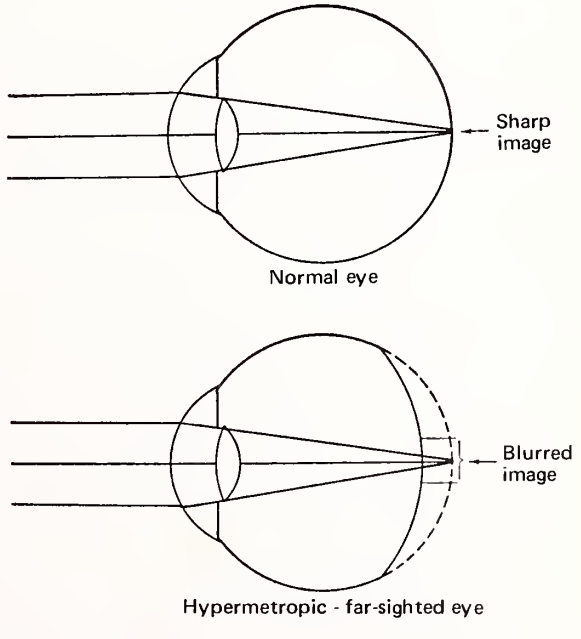


Figure 9.

GLAUCOMA

Glaucoma is a condition in which the fluid pressure within the eyeball is abnormally high. There are many types and causes of glaucoma, each with its own signs and symptoms, but in all cases early detection is the most important factor in the successful treatment of it. Glaucoma is a vision-threatening condition and should be treated as such.

In the initial stages of the condition there is little pain experienced, though blurring and mild discomfort may be experienced. Congenital glaucoma is a condition which generally requires surgery as soon as possible to prevent extensive damage to the eye by the stretching and subsequent detachment of the retina, and harm to the optic nerve. It may be primary (not associated with any other ocular condition), or secondary to some other eye disorder. Such patients may have hazy, opaque corneas, with the pressure causing the cornea to bubble forward and the eyeball to appear large and unsightly. Vision is usually poor (sometimes no more than perception of light) and visual fields are generally constricted, resulting in tunnel vision. Halos are frequently seen around electric lights.

Because glaucoma seldom occurs on its own in children, teachers would need to be informed about and be aware of any other related visual condition. Any alteration or adaptation of the classroom environment should be as a result of the eye specialist's recommendations. Consideration should be given to the child's peripheral loss, but apart from this, the child with controlled glaucoma may function quite adequately within the classroom provided he has frequent eye checks. If the child's glaucoma is controlled with regular administration of eye-drops, these drops themselves may have annoying side effects such as causing slight blurring of vision and constriction of the pupils. On these occasions, nothing can be done other than to wait for the effects to die away and visual function returns to the usual level.

KERATOCONUS

Keratoconus is a condition where the cornea becomes cone-shaped. It first becomes noticeable sometimes in the teen years. It generally occurs bilaterally, and is more prevalent in women than in men. It is generally believed to be hereditary.

Onset of the condition is slow initially, the patient finding that a new prescription is needed each year or 6 months during a time when refractive errors should be fairly stable. Distance vision is generally worse than near vision; the cone-shaped cornea induces nearsightedness. Close work is not greatly affected, though the chalkboard may become increasingly difficult to read. Visual acuity will depend upon the extent of the condition and may range from mild distortion to severe visual impairment which cannot be adequately corrected with spectacles or contact lenses. The condition may progress to the point where the cornea ruptures resulting in blindness or severely reduced visual acuity. There is generally no observable loss of visual field, but rather an overall distortion of the visual field. As the condition progresses, a diagnostic sign noticed in these patients is the bulging of the lower eyelid when the patient looks down (Munson's sign)

Contact lenses are often used to retard the effect of the bulging of the corneal cone; however this is not always successful. In severe cases, corneal transplants may be successful if performed before the condition progresses to the more advanced stage.

MACULAR DEGENERATION

Macular degeneration is a progressive deterioration of the macula — an increasingly depressing situation since no effective treatment of the condition exists. Symptoms of the condition vary from slight to quite severe and are characterized by central scotoma for colour (blues being affected before the reds) and some loss of central vision to a greater or lesser extent. Disturbance of the pigment in the macula takes place causing yellowish granules to appear at its centre. In exceptional circumstances, a "hole" appears at the centre of the macula.

These changes usually occur during the ages when physical stresses are most marked — during the period just prior to or just after birth, at the time of cutting permanent teeth (6-8 years), maturity (20-25 years), the onset of senility (45-50 years) and old age.

As in all cases where central scotoma occurs, the teacher may have to resort to the use of large print material, and encourage the student to use the area of the macula outside the affected region to perform close work activities. The use of scanning techniques (moving the eye about over the area to be seen so that the "blind spot" does not fall on details that are crucial to accurate interpretation and perception), or focussing so the image falls on an unaffected part of the retina, are skills that the student needs to master, and practice consistently. He can then utilize these same skills (though progressively less effectively) as the condition deteriorates.

MARFAN'S SYNDROME

Marfan's syndrome is a congenital abnormality of the connective tissues of the body, sometimes known as arachnodactyly (spider fingers). It is an inherited condition, with some indication that it is slightly more predominant in males.

The signs include abnormally long, thin bones which are particularly noticeable in the fingers and toes, long narrow skull, high arched palate, hyper-extensibility of the limbs, funnel or pigeon chest, kyphosis and/or scoliosis, and cardio-vascular problems. Various eye abnormalities, some of which become more apparent between the ages of 11-15 years, include dislocated lenses causing a general blurring of vision, or in some instances may cause double vision in one or both eyes. These children may also have a displaced or multiple pupil.

High myopia is common with resultant retinal detachment causing a visual field loss corresponding to the area affected. A squint may develop due to the decreased visual function. Surgery is not generally recommended. Marfan's syndrome sufferers may exhibit different coloured irises, have bluish coloured sclera, and suffer from nystagmus.

As yet there is no specific treatment for the condition itself, but both the heart and eye anomalies are amenable to surgical intervention. Genetic counselling is usually indicated in high risk situations like this. (Refer also to "Dislocated and Subluxated Lenses").

MUSCLE IMBALANCE

This condition covers the terms of strabismus, squint, crossed eyes, "wall" eyes, in fact any situation when the eyes are not straight. One eye may deviate upwards, downwards, inwards or outwards because of a muscular imbalance. It does not allow the eyes to focus on the same spot at the same time. When one eye is turned inwards, the disorder is termed convergent strabismus, or crossed eyes;

when one eye turns outwards, the condition is known as divergent strabismus. Hyperopia is one eye deviating upwards.

To avoid the inconvenience and confusion of double vision, the images sent to the brain by one of the eyes is frequently suppressed completely. Since the vision in this eye does not develop any further, the ability to see will not improve to reach full potential. It is essential, therefore, for corrective training to begin as early as possible, before the vision can no longer be improved. Corrective spectacles, eye exercises, special eye drops, patching of the good eye, and surgery to restore muscle balance can do much to straighten the eyes. Teachers may need to be diligent in seeing that any prescribed treatment (medical and/or physical) is carried out consistently.

By the time the child reaches the age of 11 or 12 years, and the condition remains unresolved, it is reasonable to assume that sight in the affected eye cannot be improved any further, and the teacher can do little to ease the situation. But provided that the sight in the functioning eye remains good, there should be no real problems experienced within the classroom other than poor depth perception. Near and distance vision should not be adversely affected, though lowered performance on the sports field or in the playground may be anticipated, due to the reduced ability to assess distances accurately. Care should be taken not to "overload" the good eye with excessive close work, without providing regular eye-rest periods. (Refer also to "The One-Eyed Child" and "Amblyopia").

NEARSIGHTEDNESS (MYOPIA)

Myopia is an inability to focus the eyes on distant objects, caused through the shape of the eyeball being longer than normal. *(Figure 10)* The normal accommodation mechanism of the eye system in a myopic eye focusses images of distant objects in front of the retina, and what is recorded by the retina is a blurred and indistinct picture. Because close work causes no problems in the majority of cases, these students are frequently avid readers, good at academic studies but poor at athletics, sports and games activities particularly as these require good distance vision.

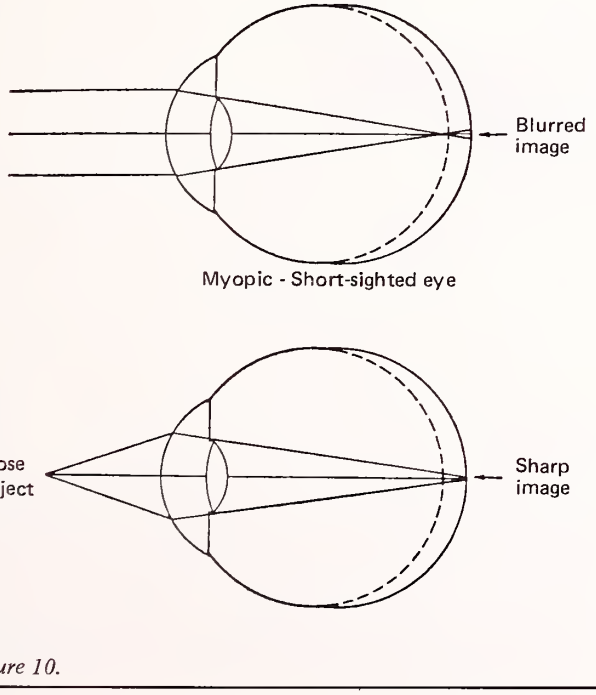


Figure 10.

In most cases, myopia is correctable by glasses which allow images of distant objects to be focussed comfortably on the retina. The condition usually stabilizes in early adulthood, but some instances occur where progressive myopia develops in association with other eye disorders, specifically cataracts and glaucoma, in which case an eye specialist's recommendations must be sought. Severe nearsightedness involves a distinct possibility of retinal detachment from only a slight bump, so care should be exercised in body contact sport, or rough-and-tumble activities in the playground. Care should also be practised with regard to preventing the glasses from becoming damaged or broken through aggressive play. Regulations on the amount of physical activity as recommended by the eye specialist should be strictly observed in these cases. (Refer to "Degenerative Myopia').

Within the classroom, little alteration to normal closework procedure is indicated, though reading from the chalkboard may prove difficult. Preferential seating close to the board may be a solution, otherwise provide the pupil with his own copy of what is on the board. His written work may be small and cramped in style, and you may decide to encourage him to "open up" his work to make it easier for others to read back. Resorting to more elaborate oral descriptions of distant objects will overcome the possibility of his missing important details when close access to the stimulus material is not possible. Encourage also, consistent use of the prescribed aids when distance viewing is undertaken.

NYSTAGMUS

Nystagmus is an involuntary, constant movement of the eyeball caused by a nervous jerking of the eye muscles. It is more frequently secondary to other eye conditions, but can occur on its own. It occurs as a congenital nervous disorder, usually affecting both eyes. The patient is, therefore, unable to fixate his eyes steadily on the one spot, and this will severely hamper his ability to read at speed.

There is no cure or treatment for this condition, though it is understood that an increase in the nervous state of a person with nystagmus produces an increase in the severity of the eye oscillation. The pupil has a greater chance of a better performance when he is calm and unhurried, and can control his own terms of action. He simply has to learn to adjust himself to the handicap as best he can.

Because nystagmus usually occurs in conjunction with associated eye disorders, more attention may need to be given to these other conditions, since they may be the cause of a greater visual and learning problem than the nystagmus itself. (Refer to the chapter "Additional Notes on Coping with Specific Conditions — A: Nystagmus Suffers").

OPTIC ATROPHY

Optic atrophy occurs when the optic nerve fails to transmit the images in their entirety from the retina to the brain. The impulses which reach the brain may be distorted or incomplete in some way. The eye itself may be performing its visual function correctly, but the optic nerve is malfunctioning. In this situation, prescribing glasses or magnification aids does little to alleviate the problem — the

result is that the brain receives an enlargement of any distorted image.

A very distinctive learning difficulty is presented to a teacher who has an optic atrophied child in the classroom. The visual memory compiled and stored in the child's brain over the years may contain many anomalies and misconceptions because of the incomplete or distorted images it has to work with. For this reason, a combination of visual, tactile and oral stimulations is needed to present a truer concept of many of the experiences encountered in the child's day-to-day living. What makes the problem even harder to understand and accept is the fact that the child does not usually **look** visually impaired in any way, and is unlikely to be wearing glasses, yet the responses he gives (orally or in written form) would indicate that he may have missed out on perceiving many of the important details that are readily picked up by the other children. Resist the temptation to question his intellect. He may see things at a great distance but fail to appreciate objects in the middle distance but in the same "line" of vision; he may see some details in a picture but miss others; his visual performance generally appears to be inconsistent.

Through consistent effort and patience on the part of the teacher, the child should be encouraged to approach all visual tasking with care and thoughtfulness, and in an unhurried manner. Extra time should be allowed to visually explore and discuss printed and pictorial material. Systematic scanning of a larger area may take some time to teach and develop as a skill that is later brought into automatic operation on the appropriate occasions. Enhance the visual imagery with concrete and tactile examples where possible, otherwise spend a little time in discussing, questioning and pointing out the important details orally.

Optic atrophy may be the result of one or more of a variety of causative factors — brain or head injury, tumour, encephalitis, disease, or congenital malformation. There may be other ocular or neural anomalies, or the condition may exist on its own. The optic atrophy condition itself is irreversible and cannot be overcome by optical aids, so it remains for the child to learn to function as best he can with the vision that he has. Provided the cause of the optic atrophy is not an active/progressive/degenerative condition, the optic atrophy should remain static indicating that the child's **vision** will neither deteriorate nor improve. If you notice that his performance **is** improving and he appears to be "seeing things better", the odds are that he has learned to use what vision he has more efficiently and effectively.

RETINAL DETACHMENT

Retinal detachment occurs when the retina separates from its supporting structures — the choroid. The detached portion dies due to the lack of nourishment, resulting in a "blind spot" in the field of vision corresponding to the area of detachment. It can occur in a variety of forms and is associated with many different causes. The type and cause of detachment will determine to a large extent the type of treatment. In most cases there is no pain or discomfort, but the person may experience sparks or flashes of light, followed by a blank in the visual field.

Visual acuity may be markedly decreased, particularly if the macula is involved. Swelling of the retina may occur causing the condition of micropsia when objects appear smaller when viewed with the affected eye. Colour vision may also be impaired in cases of macular involvement.

If untreated, the condition becomes steadily worse and progresses towards total blindness in the affected eye within a few months. It is very difficult to predict how much vision can be restored, as the length of time between detachment occurring and surgical intervention is crucial. In most cases post-operative improvement is rather slow; it may take months before vision reaches its best level of improvement.

Treatment consists of one or sometimes several operations by an ophthalmic surgeon. Using a tiny point of intense light or extreme cold for a fraction of a second, the surgeon is able to create minute patches of scar tissue that serve to "stitch" the retina back in its correct position. This form of treatment is usually completely successful if it is carried out before the detached tissue dies.

Under normal conditions, the retina is very firmly attached to the choroid, but a sharp blow to the head may be sufficient to cause a retinal detachment or tear. Other conditions which show a propensity towards detachment include high myopia, glaucoma, diabetes, retrolental fibroplasia, or any eye condition which places unnatural stress on a stretched retina. Since retinal detachments are due to trauma, ocular disease or a general physical condition, they are not an inherited trait. The condition which causes the detachment may be inherited (e.g. diabetes), in which case genetic counselling may be necessary.

RETINITIS PIGMENTOSA

Retinitis pigmentosa is a progressively degenerative condition of the retina affecting both eyes. It is a primary degeneration of the pigment layer of the retina, and particularly of the rod cells of vision. As a consequence, the pigment migrates, collecting in small clumps.

The condition runs in families, appears early in life and progresses with age until vision is almost gone. The first symptoms are an inability to see at night, and a gradual reduction in the field of vision. The blood vessels in the retina become more and more narrow, thin and contracted, and the optic nerve becomes waxy pale. The failure of vision decreases from all sides so that often there only remains a small area of live retina, fortunately in the fovea centralis area. This contraction of the field of vision down to a pin-hole has been called tubular, tunnel or gun-barrel vision. A person with tunnel vision sees more of an object the further away it is from his eyes. Thus the use of enlarged print in preference to clear, black (but smaller) print may be handicapping the reader further.

The tunnel vision and the night blindness create very much of a problem, and yet such patients do surprisingly well because central vision generally is unaffected until the very advanced stages of the condition. Unfortunately, at the present time, there is no known method of treating or curing the disease, or of arresting its progress. Additional problems sometimes encountered with retinitis pigmentosa include photophobia and the development of cataracts.

Ushers syndrome and Lawrence-Moon-Beidl syndrome are two hereditary conditions which contain retinitis pigmentosa as part of the transmitted genetic anomalies.

Teachers encountering a student with retinitis pigmentosa would need to remember the two debilitating traits of the condition — tunnel vision and night blindness. Taking each in turn, tunnel vision in itself should not cause too great a problem in reading, close work or viewing in a line straight ahead. In approaching or handing work to these students, do this always from directly in front of the pupil, never from behind or from the sides unless you have

given him a verbal indication of your intention beforehand. In areas of mobility and orientation he will need to exercise additional care to scan down to his feet, well to left and right before crossing roads. Teachers who wish to simulate what it is like to operate under daytime conditions imposed by retinitis pigmentosa can cut an oval hole 4cm long by 2cm high in the centre of a 35cm square card. Hold the card between the index and middle fingers of each hand and place the thumbs just in front of the ears so that the opening is central in front of the eyes. If you are not too inhibited, endeavour street travel, sporting activities, socialising and your favourite pastimes, in fact every daytime activity under this handicap and you begin to appreciate the restrictions of tunnel vision. Holding a 30cm tube of 3cm diameter to one eye also indicates the restriction of the visual field. Adjust your general approach to the pupil to include consideration of his considerable field loss.

Add to this the inconvenience and restriction of not being able to see to do things at night. My advice to teachers and to the affected students has been to do as much of the sight tasks (homework, swatting, leisure activities, etc) during the daylight hours and resort to tapes, records, talking books and other listening activities if studying needs to be continued after sunset. A sighted companion is advisable if travel after dark is contemplated, otherwise a very powerful lantern (torch light is usually not strong enough) should be carried.

Because there is no treatment for retinitis pigmentosa, the handling of such patients is critical. Psychological counselling may be beneficial in helping them deal with the emotional trauma of a progressive visual loss. Low vision aids in the form of telescopes and miniscopes are often used when central visual acuity is reduced, however the success of these aids is often limited by the extent of the remaining visual field. Such people may need training to improve their ability to scan effectively up, down and to the sides. Orientation and mobility training is also an essential part of their programme, as is genetic counselling.

RETINOBLASTOMA

Retinoblastoma is a type of tumour of the retina, more properly called neuro-epithelioma. The condition is inherited and can usually be traced back several generations, and may occur in several children of the same marriage.

The first observable signs, usually seen before the age of 3 years, is that the child's eye looks like a "cat's eye" in the dark, caused by a whitish reflection behind the child's pupil. This is actually caused by a white mass of quickly

growing cells in the retina often covered by blood vessels and occasionally flecked by hemorrhages. The affected eye is often hypertropic (deviating upwards). It doesn't take long for the lens and iris to be pushed forward blocking off the outflow of the aqueous humour. Pressure then builds into the condition of secondary glaucoma.

The growth, meanwhile, begins to extend back along the optic nerve towards the brain which indicates a fatal situation if not checked. The only positive way to save life is to surgically remove the eyeball and all affected parts, severing the optic nerve as far back as possible. If this is done sufficiently early and before the growth has spread too far into the optic nerve, then the prognosis for the child is quite good, although there will obviously be no sight on that side.

Retinoblastoma can attack one or both eyes, there being a greater chance of both eyes being affected if the condition runs strongly within the family. The weaker eye usually succumbs first and it may be months or even years before the second eye starts showing the tell-tale symptoms. Having diagnosed retinoblastoma in one eye, radiation treatment may be used to arrest its progress in a few cases, thus saving vision at a usable level in the second eye through keeping a close watch on it. The success rate is still regrettably low, however.

RETROLENTAL FIBROPLASIA

Retrolental fibroplasia is a disease commonly found in premature infants of low birth weight who receive oxygen therapy. The condition is very variable and may range from minimal ocular damage with no great visual impairment, to complete retinal detachment and scarring which results in total blindness. The extent of the problem depends on many factors including the length of time the infant received oxygen as well as the concentration of oxygen administered. Cases of retrolental fibroplasia dropped markedly once the cause was identified, and oxygen levels are now very carefully monitored in incubators for premature babies. A few cases, however, continue to emerge.

When an infant receives high levels of oxygen, there is a failure of the retinal vascular system to develop properly. When the child is removed from the oxygen rich environment, the blood vessels of the retina cannot supply the necessary levels of oxygen. This results in a tremendous growth of blood vessels together with the development of fibrous tissue. The new blood vessels cause a stretching of the retina and may eventually lead to retinal detachment. These changes are usually observed at about 1 month of age, but it is difficult to say how far they will progress. Approximately 20% will go totally blind.

In most cases, external signs of the condition are non-existent. In severe cases, the eye may appear small (microphthalmia) with a grey membrane behind the pupil. Associated disorders may include nystagmus, myopia (nearsightedness), glaucoma and ureitis. Very severe cases generally have no usable vision or extremely low levels of vision. However, in less severe cases, the impairment may be limited to a decreased level of visual acuity. These patients can generally be helped with low vision aids such as telescopes and miniscopes.

RUBELLA SYNDROME

Congenital rubella is a syndrome due to the exposure of a foetus to the rubella (German measles) virus. The severity of the resultant defects will depend on how early in the pregnancy the virus was contracted, and the severity of the infection. Ther first three months is critical with the first four weeks particularly so. It appears that the virus has the ability to interfere with cell division and multiplication, thus causing non-specific chromosomal changes.

A rubella syndrome child will exhibit eye, ear, and heart defects; however, other organs may also be involved. Visually, the presence of cataracts gives the eyes a hazy, whitish appearance. Glaucoma may also be present. The eyes are generally small (microphthalmia), and viral inflammation of various parts of the eye may be added complications. The back of the eye sometimes takes on an appearance similar to retinitis pigmentosa, but the condition is non-progressive, and does not in itself seem to interfere with vision.

Visual acuity is generally reduced due to the cataracts. Congenital glaucoma will also result in restricted fields of vision. Nystagmus may also be present as well as the obvious squint. Mobility skills will depend on the extent of the damage. While the cataracts and the glaucoma may be treated surgically, the prognosis is poor since viable virus cells persist in the lens and may cause a subsequent inflammation as a result of the surgery. Severe complications occur in up to 35% of rubella eyes after cataract extraction.

Vaccination is the ony way to prevent maternal infection during pregnancy. Without immunization, there is no sure way to prevent the viral infection.

TOXOPLASMOSIS

Congenital toxoplasmosis is caused when a pregnant mother becomes infected by a small organism called the toxoplasma gondii. The organism is transmitted through contact with such domestic animals as cats, or by eating raw meat that is contaminated with the organism. Cooking will generally ensure against infection in the latter case.

The organism appears to attack principally the nervous tissue and may cause brain damage to affected individuals, as well as damage to the retina. The first signs of a problem may be a decrease in visual acuity in one or both eyes, and/or the development of a squint. Further examination by an eye specialist shows lesions on the retina. These areas will correspond to "blind spots" when the visual fields are plotted. If the lesions occur in the macula, as is frequently experienced, then central vision will be affected with associated problems where reading is concerned, and the effect can be quite devastating. Decreased visual acuity in an affected eye may result in the eye turning in or out (strabismus). The condition is usually not progressive although new lesions may develop, thus periodic examination is important.

Children with toxoplasmosis can generally be helped through the use of low vision aids such as miniscopes and telescopes. (Refer to "Macular Degeneration" for methods of teaching children with central scotoma, also "Additional Notes on Coping with Specific Conditions— E. Blind Spots — Central Scotoma" in the next chapter).

CHAPTER 3

ADDITIONAL NOTES ON COPING WITH SPECIFIC CONDITIONS

A. NYSTAGMUS SUFFERERS

The condition of nystagmus (on its own, or in combination with other visual anomalies) would appear to be the most common eye problem likely to be encountered by the classroom teacher. It is frequently coupled with albinism, cataracts, optic atrophy, the several strabismus variations, amblyopia, astigmatism and myopia, but can occur as a single visual anomaly. In any case, the problems exhibited by nystagmus sufferers (particularly in a reading situation) bear additional explanation. To show how the eye movements during reading activity are impeded by the nystagmic condition, an explanation of the normal reading action is included here, for comparison.

During the activity of reading, the eye jumps and hops along the printed line from left to right. This is known as the saccadic eye movement. Using an average reader reading at just over 150 words per minute as our control, it takes him about 1/8 to 1/5 of a second to complete one saccade, which covers the movement from one fixation point to the next. Our reader would spend about 1/5 of his time moving his eyes deliberately, and the remaining 4/5 of his time staring at the one point. On these occasions of fixation, the eyes are still flickering involuntarily over a small area of print approximately 10° wide which may contain on average 1.5 to 2.0 words. (Diagram A). During the saccade movement, plus the times immediately before and after it, the reader is actually blind with no image being registered on the retina. It is during the remaining period of the fixation, when the eye is relatively static that the images form and the brain organizes the electrical impulses into perception. We do not need to see very much for very long for an impression to be created — a flashed picture lasting 1/5 of a second is sufficient for the brain to receive and process an accurate image of a seen object.

The muscles that control eye movements are activated from the visual motor center of the brain which is situated some distance from the eyes. Having located the first fixation point, the eyes automatically focus onto the main features (ignoring the irrelevant ones). The center of the next saccade is within the field of peripheral vision, but it must be recognized meaningfully before the brain can motivate the muscles which target the eye accurately onto it. The amount of neurological feed-back must be considerable to stimulate the exact amount of muscle relaxation or contraction during each saccadic eye movement.

It would seem that it is not the time spent processing the information by the brain that limits the reader; it would be the physical limitations imposed by having to move the eye accurately to specific groups of letters, together with the complex cortical involvement just to get the eye to move to the right place. Reading "speed" is governed by the distance between fixation points, and not on how long the eyes remain at fixation points. Many speed-reading programmes aim at training readers to have fewer fixation points per line of print, thus covering more words on each fixation.

Superimposed on all this physical activity would be the restricting influences of nystagmus, which affects principally the control of the eye muscles (Diagram B), with evidence being observed in reduction of reading speed, closeness to the printed material, the frequent losing of the place, increased frustration, to name but a few of the more obvious factors.

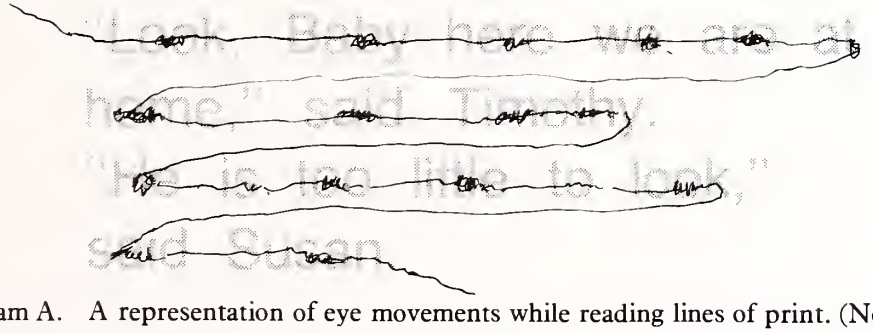


Diagram A. A representation of eye movements while reading lines of print. (Normal saccadic eye movement).

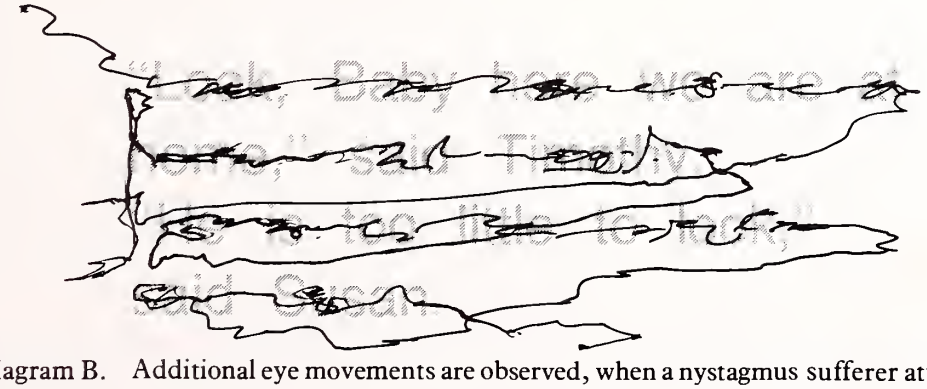


Diagram B. Additional eye movements are observed, when a nystagmus sufferer attempts the same task!

Nystagmus is a neuro-muscular condition, not an optical one; hence, glasses that are prescribed will be for any additional optical condition, and may not help the nystagmic condition in any way. In a few cases only will contact lenses be of assistance, particularly when the lenses alleviate the tension factor of poor vision, thus removing the cause of gross nystagmus and allowing it to settle into the medium or fine range of eye movement. In these cases, the visual acuity potential is more closely realized.

The four main types of nystagmus are the erratic, involuntary eye movements horizontally, vertically, roving or rotary, The oscillation may be described in the ophthalmic report as "fine" (akin to a quiver and barely detectable except to an eye specialist) or "coarse" (a very obvious oscillation). You may find that the child compensates for this eye wobble in a variety of ways —

(a) He may transfer the motion to his head, so that his head does the wobbling, effectively cancelling the movement in the eyes so that they remain steady in relation to the object being viewed. With the horizontal variety of nystagmus the head moves rapidly from side to side; with the vertical variety, he is frequently nicknamed "Noddy". I am unfamiliar with the transference of eye movement to head movement when the roving and rotary conditions occur, though I can understand that instances do exist.

(b) The habit of finger poking or knuckling the eye(s) (the finger tip or the index knuckle is pressed into the outside corner of one or both eyes) may also assist in making clearer the distance vision. The pressure would appear to hold the eye steadier, allowing the viewer to improve his visual acuity.

(c) A child with the more common horizontal nystagmus may resort to angling his head at right angles to his body (he may bend sideways at the waist or put his ear down to his shoulder) to view things that are tall and slim in profile. This permits the oscillation to traverse the length of the object rather than cut across it repeatedly. Inclination to the left hand side appears to be preferred.

(d) Book work is held very close — anything from 2cm (when the eye lashes may brush the page, more evident when the child is using only one eye to read with) to 20cm. The child's preference for this selected distance should not be altered in an effort to establish a conventional reading distance, because this is the distance at which he can operate best with regard to his own comfort, focussing distance, eye fatigue, and speed of reading. The greater the distance the nystagmic eye is from the object being viewed, the greater the swinging arc of sight (particularly when the coarse condition exists), and the greater the difficulty in identifying the finer detail.

To simulate the difficulties experienced in this situation, have someone hold a page of a book or a sheet of typed paper at an appropriate distance from your eyes, then have them move the page quickly from side to side (or up and down, or haphazardly in any direction) over an area of about 5 square centimeters, and try your reading speed! Applying concentration and practice, your results will still be lower than your normal ability at reading.

Controversy exists over the advisability of training any particular child away from the employment of any or all of the above mannerisms. My own personal view regarding this debate is to leave the child alone — he has devised his own method of compensating for his condition, and his method of improving the clarity of his vision is comfortable to him and acceptable for some or all of his visual tasking. His peer group or social convention will dictate to him what is socially acceptable to the group within which he operates, and he will continue to make adjustments as he matures and expands his social contacts.

I know of many cases where a person with nystagmus will opt out of any important and immediately threatening visual tasking situation until he can approach that task calmly and in his own time. He has identified that his ability to give of his best is considerably impaired under tension, so he has learned to select his own time and conditions, thereby giving himself a better chance of a good performance with better results. Teachers may wish to apply this understanding to school activity situations by not applying pressure on your nystagmus sufferer to do things "here and now". Tension, pressure, tiredness, excitement, apprehension, over-enthusiasm, being off-colour, physical exertion, etc, all tend to accentuate the involuntary eye movement, with a proportional decrease in the child's ability to cope visually. In situations like this, allow the child time to regain his composure before requesting him to perform the set task. Creating a calm, unstressful yet stimulating and busy classroom atmosphere is the crux to your success in dealing with nystagmus.

You are now aware of the hardships imposed on a child with nystagmus who is endeavouring to cope with mastering reading skills. In spite of so many things working against him, you may be surprised that he can read at all. The human body, being what it is, is able to compensate in so many ways, and a child's ability to cope under adversity is often cause for amazement. A child's efforts at overcoming his disabilities by using intrinsic resources is to be encouraged at all times, and only when these resources seem to be exhausted or waning should the following training programme be brought into operation. Evidence of difficulties is observed by the frequency with which the reader loses his place during line changes. This proves to be time consuming, embarrassing and frustrating, leading inevitably to an increase in tension and a tendency to develop a reading reluctancy attitude. The child wants to avoid a situation which for him has a high failure or poor performance potential.

This training programme is based on teaching the child to use the technique of back-tracking along the line just read before dropping to the line below, rather than moving diagonally from line's end to the new line. There are four stages in teaching this skill.

1. Use a clean, black cardboard sheet to underscore the line of print to be read — masking off irrelevant material and highlighting the "plane" along which the eyes are moving, and providing a guideline on which to back-track. It is essential that the card is not dropped to a lower line until the eyes have completed their reverse traverse to the starting point of the line. At this stage, the next line of print is uncovered, and the procedure is repeated. It is better if the child is encouraged to manipulate the masking card for himself, so that he establishes the patterning and controls the entire operation from the beginning, relying only on your directions and verbal instructions.
2. When you feel that the skills are understood, and the child is ready to proceed to the second stage, the masking card may be replaced by finger-pointing.

(This is not to be considered as cheating; it is an aid, in this instance, to teaching a reading technique, and is only a means towards an end.) At the end of the line, insist that the finger return along the line just read before dropping to the next line down. Thus the back-tracking technique is maintained. About this time, the practice should be emerging as a more natural and automatic action in the reading situation, with only a few reminders or an occasional check that it is occurring.

3. When the habit appears well established, the forefinger of the left hand may now be used as a line marker or indicator, by remaining stationary at the beginning of the line being read. At the line's end, the eyes must travel back along the line to the marker finger, then drop down to the next line together with the finger.
4. The final stage is reached when the student is able to back-track accurately unaided and unprompted.

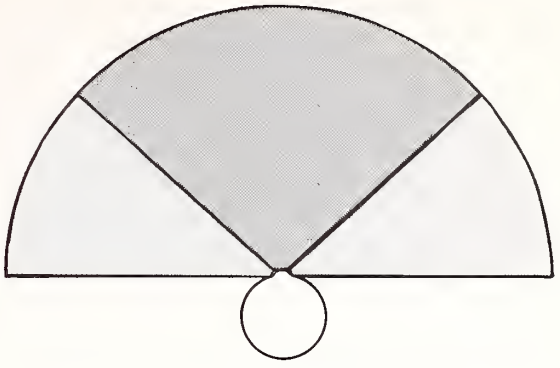
I find this method the most logical, the least complicated with regard to manufacturing special aids (cardboard "windows" don't always match variations in line lengths, print size, line spacing, etc), and most readily understood and adopted by both teacher and pupil. It is better if you can begin this procedure at an early age, before the child has experienced too much in the way of frustration and embarassment factors which inexorably lead to an early development of a reading reluctance attitude. Try to keep the reading as an interesting, stimulating and pleasurable activity, keep the approach light, low key and free from stress, praising every appropriate effort and encouraging perseverance. During the early stages, the instruction periods should be of short duration with frequent eye-rest periods. Check that lighting conditions are adequate and that seating is comfortable.

B. CHILDREN WITH USABLE VISION IN ONE EYE ONLY

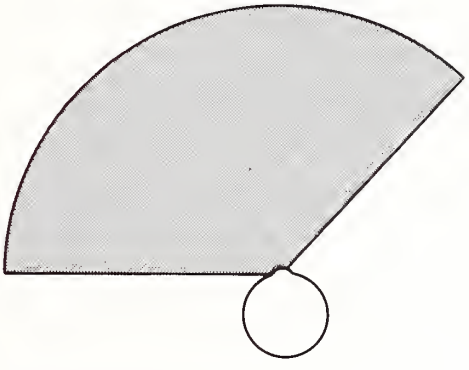
Another very common condition encountered within the classroom, and which is needful of special consideration here, is the case of the child who uses only one eye for sight tasking (specifically reading). The failure to use the sight in the other eye may be from choice, or because the visual acuity in the poor eye is so low that it may be considered of no consequence. A child's performance in the classroom is generally governed by the degree of vision he has in his best eye, a one-eyed individual being not too severely handicapped in most activities. Many motorists continue to pass sight tests for licence renewal with sight in only one eye; many people in the work force function safely and productively with the same affliction; sportsmen and women find that the condition does not prevent them from competing or participating in their chosen activity. Their level of performance would be governed by their ability and their method of overcoming the debilitating effect of the visual handicap. By and large, being one-eyed should not in itself be any great handicap.

Several passages in this book explain how and why a child comes to have usable vision in only one eye — injury, disease, lack of use, or some other factor. For the sake of this discussion, we can look at the things that can be considered in teaching a child that uses vision only in his left eye. If you have a child that has vision on the right side only, then make the necessary substitutions as you read through.

In any case, the problems associated with monocular vision are two-fold — *Figure 11.*



Binocular (normal) vision.



Vision from left eye only.

Figure 11.

(a) the child will lack binocular vision and therefore will be unable to judge distances accurately, and
(b) he will have a "blind side", (in our example, the right side).

It would be very important for you to know the condition of the sight in the left eye (the eye he is using). Care should be taken that at all costs, the sight in the seeing eye does not become impaired through laxness in implementing adequate safety measures during physical activities, through injury from carelessness, through fatigue from overuse, etc. Periodic eye examination by an eye specialist should be arranged particularly if there is a possibility that the condition in the non-seeing eye could occur in the remaining eye as well. In the case of progressive degeneration (macular degeneration, Staargardt's disease, retinitis pigmentosa, etc), the sight in one eye may deteriorate more quickly than in the other, and both eyes will be affected, but the child will always use the eye that has the better vision.

In our example case, being right-side "blind", it is showing your consideration of his needs if you approach him or present work to him from either in front of him or from his left side, unless you have verbally informed him beforehand of your intentions to do otherwise. Encourage him to scan well to his right to visually cover the area that is lost when he is looking straight ahead. This is an essential

skill when crossing roads, or in the playground. He will not be aware of a silently moving danger or hazard approaching from his right, will therefore not take avoiding action and may put himself at risk in such situations. Teach him to visually check out all movement picked up by his peripheral vision, any feed-back he gets from his other senses which indicates activity out of his field of vision, unfamiliar sounds; spend time verbally explaining and discussing the boundaries for safe participation you expect from him for activities within the classroom, the playground, the school property, the neighbourhood community, class visits, the route to and from school, and the community at large. Teach him the techniques which enable him to cope confidently and safely in any situation likely to be encountered.

For closework within the classroom, you may notice that he twists his head slightly to the right in his efforts to get a clearer image onto his retina, the left eye being lined up more squarely to the page. This mannerism will also be observable in his efforts to view distant objects, or when he is concentrating on visual tasking or visually exploring for detail. Don't make any effort to alter this practice — this is the way he has found that works best for him in performing his visual tasks. All his energies are concentrated on seeing through his good eye, and to dissipate this energy into thinking of less important factors reduces his ability to concentrate and work visually at his best speed and with efficiency.

Several things can be done to help a one-eyed child to evaluate distances more accurately. If a child is familiar with a particular area, e.g. the playground, take some time with him to pace out the distance between the classroom door or the side of the building to all the equipment in the playground. Build up spatial concepts by viewing one specific piece of equipment from different angles, and different parts of the playground, and relate this to distance assessment (confirm by measuring). Draw a plan of the playground, include the various pieces of apparatus, keeping as close to scale as you can. Several exercises in visual assessing — which is closer to the climbing frame, the swings or the jungle-gym?, confirmed by going out and measuring, can be of benefit to the whole class, not just your one-eyed pupil.

As his skills at distance judgement improve, so the sophistication of the exercises can be increased. Be sure that at all levels, he relates intermediate distances to known objects, and encourage mental calculation, e.g. if he knows that the school gates are 50yds away and the yellow flowering bush along the path is 30yds away, then somebody standing between the bush and the gates is likely to be about 40yds away, and so on. Spatial relationship and orientation skills, coupled with a fair dosage of common sense and average intelligence will enable your one-eyed student to assess distances quite accurately after a time, and certainly sufficiently well to function safely in the community. Combining this ability with the practice of scanning consistently to his right, many sporting activities come within his scope of participation. Some intervention on your part may be needed to develop this ability to its full potential, but his success here, of course, will also depend on his level of motivation, aggressiveness, self-image and self confidence. If the student is very sensitive about his disability, discourage teasing and ostracization tendencies by practicing acceptance of the child on his own terms, and encouraging his peer group to do likewise, unconditionally.

Your approach to the child with vision in one eye only will be largely governed by the amount of vision he has in his seeing eye. If it is 6/18 or better and likely to remain so, then nothing need be done in terms of alteration or adaptation of a normal school programme other than the considerations mentioned earlier. If it is 6/24 or less, then the adaptations will be detailed under the several headings, according to the condition that has caused the limitation of vision, in the section of the book "Eye Conditions Explained".

C. HEMIANOPIA, LEFT AND RIGHT.

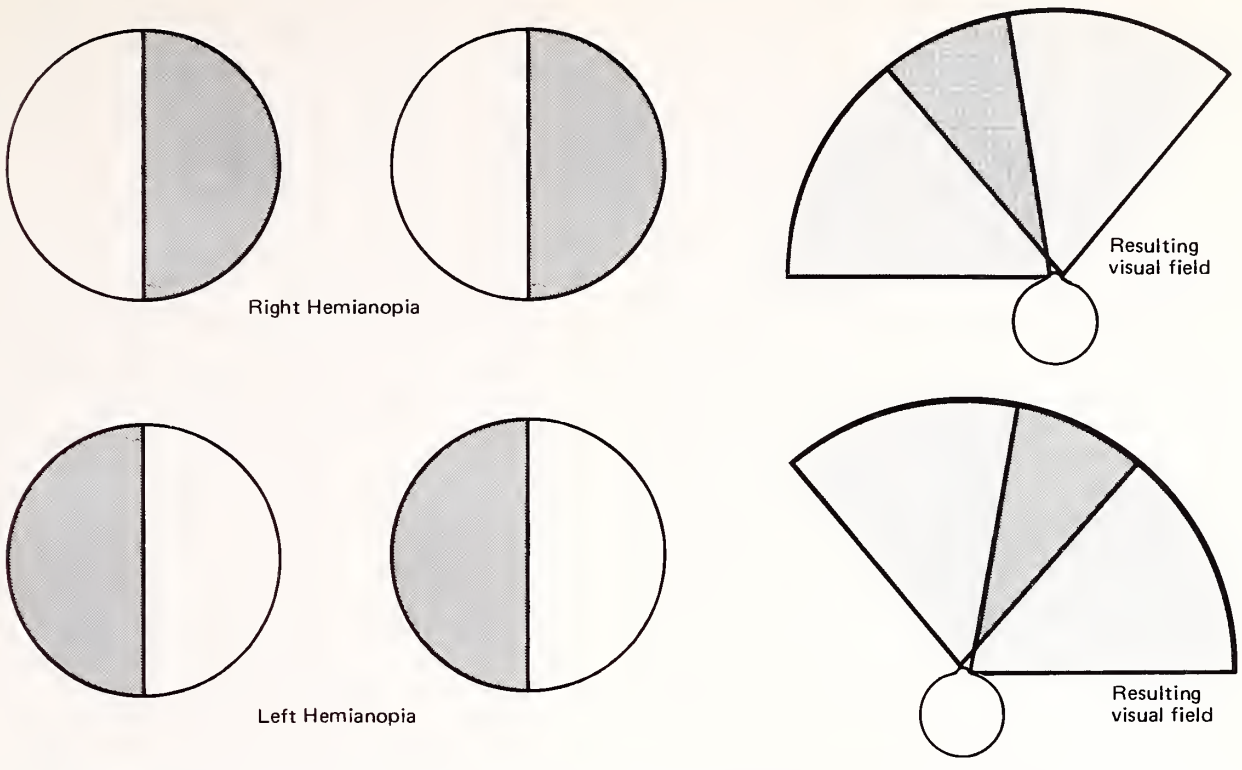
Hemianopia has been described as loss of vision in half of the visual fields in one or both eyes. The most frequent cause of this condition is from a brain injury or brain tumour which interferes with the optic nerve, in the area behind the chiasma — the junction where several of the optic nerve fibres cross over from one side to the other (refer to the diagram on page 25). Thus, if there is damage to the left optic nerve anywhere from the chiasma to the cortex, then the images transmitted from the left side of each retina are affected. But because the image of any object being viewed is inverted and mirrored by the time it reaches the retina, the patient is blinded on his *right* hand side. In describing the type of hemianopia for any particular person, we refer to the side that is blinded — thus the individual described above would have the condition of "right hemianopia", meaning that the left optic nerve was the damaged one, and the vision in the right hemisphere of his visual field is affected. He is effectively blind on his right hand side, and focussing to a point is very difficult.

From observing these two sets of diagrams, it would seem that the conditions of left or right hemianopia would be equally debilitating. In practice, however, this is far from the truth. All authorities that I have contacted have agreed that *right* homonymous hemianopia is more restrictive in terms of functioning vision than is *left* homonymous hemianopia. This can best (and most appropriately in this context) be illustrated in the reading situation.

Conventional reading skills follow the pattern whereby the reader begins the activity at the top left-hand corner of the page, moving the eyes towards the right-hand edge, saccadic eye movements included. (Refer to "Additional Notes on Coping with Specific Conditions — A. Nystagmus Sufferers" for an explanation of "saccadic eye movement"). Success at this skill is governed by the fact that the subsequent fixation points along a line of print fall within the peripheral field while the eyes have targeted on the words that are currently being "read". Because the imminent viewing space is non-existent in the condition of right homonymous hemianopia, the visual-motor co-ordination mechanism that physically moves the eyes to the next fixation point, is not motivated except by the conscious effort of the reader. The effort of reading becomes an exhausting and laboriously slow visual task. My thoughts on how to lessen this effect will be discussed shortly.

When the condition of left homonymous hemianopia is encountered, the problem of not having the imminent viewing space within the peripheral field of vision does not exist. Reading, therefore, would be less of an onerous visual task for this person. By the time the eyes have targeted and "looked" at one fixation point, visual memory has recorded the words viewed while the eyes are moving to the next fixation point, which in this instance, *has* been monitored

Figure 12.



The term "homonymous hemianopia" determines that the visual field loss in both eyes is on the same side.

within the existing peripheral field. Problems do exist, however, for the reader with left homonymous hemianopia. Just as the normal eye is automatically scanning ahead of the fixation point and doing some "pre-identification" of words, so further confirmation activity continues after the eye has moved away from the fixation point, and the words fade off along the right-hand curve of the retina. This confirmation activity is denied to our reader, and the brain is left to "guess" at some of the letters and words covered. These readers frequently make errors in word endings, or miss them out altogether, or confuse, miss or mix up groups of letters in the middles of words. Some of the smaller words may be missed out or wrongly identified simply because they are not used as fixation points.

Reading activity in both cases of left and right hemianopia is restricted because impulses from only half of the total area of the retina are reaching the brain. The "feed-in" of words from the right is either cut off at mid-point (in the case of left hemianopia) or non-existent until the mid-point of the circular field of vision (in the case of right hemianopia).

To find a way of making it easier for these students to read, my theory is to utilize the full diagonal of the retina by "feeding in" words from either the top or the bottom of the peripheral field by the reader turning the page at right angles — thus the lines of print would be vertical rather than horizontal.

I believe the saccadic eye movement is an acquired skill — it can be taught, practiced until proficiency is attained. Most printed languages read from left to right, but Hebrew reverses this, and Oriental languages read vertically. Presumably saccadic eye movement occurs in reading these scripts, as it does in English.

Children identified at an early age as having hemianopia, and being taught to read by the unconventional method mentioned above, would, I believe, develop a saccadic eye movement to accommodate vertically presented print and theoretically at least, read as effortlessly as a fully sighted person, after a period of practice.

But here is where I experience a problem, which I invite any teacher, remedial reading tutor, educator, etc, to help me solve. Throughout New Zealand I have been in contact with perhaps fewer than a dozen children with homonymous hemianopia, and most of these students (excepting one) were too well established in the conventional (horizontal) method of reading print for me to consider compounding their problems by asking them to alter their approach to the activity. Most pupils were able to read, albeit very slowly, and were adapting reasonably well to a conventional method. One little girl, younger than most at 5½ years of age, provided me with an opportunity to experiment. Discussing my theories at length with her teacher, I asked that the change from horizontal to vertical presentation be introduced as a "play" activity, firstly to see if the little girl showed any preference for one or the other as being easier for her to see. Unfortunately, not enough time has elapsed for any definite conclusions to emerge or be quoted as evidence, and certainly I would need more than *ONE* case to prove my point.

If there is any teacher who is firstly convinced that this system might work, who is also keen enough to have a try at administering the experiment, and who has a youngster with homonymous hemianopia who is having difficulty in coping with reading, then please communicate with me and I would be only too delighted to work out an individualized and personal programme with you so that your pupil could provide information to my research.

Some general help to teachers with a case of a child with homonymous hemianopia, would echo much of the

advice given in helping a one-eyed child — approach him or present work to him from directly in front or from his sighted side, unless you have verbally instructed him to the contrary; be aware of his visual field restriction in the sports field or when walking in an unfamiliar area where dangers may approach from his blind side; train him to be particularly vigilant at street crossings by encouraging him to scan well and often to his blind side; he may have difficulty in focussing to a point (near is more difficult than far), in which case he may be very poor at assessing distances; because you tend to "keep left" when travelling, a child with right homonymous hemianopia is virtually unaware of all approaching pedestrian traffic, and will have greater difficulty in moving confidently and safely because of this — it may pay to have a sighted guide, walking at his right side, to pass on verbally any information which is important, and to act as a "cushion" to potential danger.

As with the one-eyed child, you may observe that the pupil twists his head to one side, preferring to view close work out of "the corner of his eye". This is his method of getting a clearer image on a larger part of the retina, where a more complete image is relayed through the undamaged fibres of the optic nerve to the brain. He will present the sighted section of the retina to the object, and angle his head so that the image falls as close to the macula as he can manage without important features of the object falling on the part of the retina that is non-functioning visually.

In a few cases of homonymous hemianopia, visual acuity is also reduced — the hemisphere of sight is seldom at 6/6, 6/9, 6/12 or 6/18. Ophthalmic recommendations will need to be sought where the visual acuity drops below 6/60 in the sighted area, and professional assistance would need to be available with regard to providing an educational programme under these conditions.

In conclusion, it may be comforting to know that I am involved educationally with one little girl with a field reduction to the top left-hand quadrant in both eyes, who

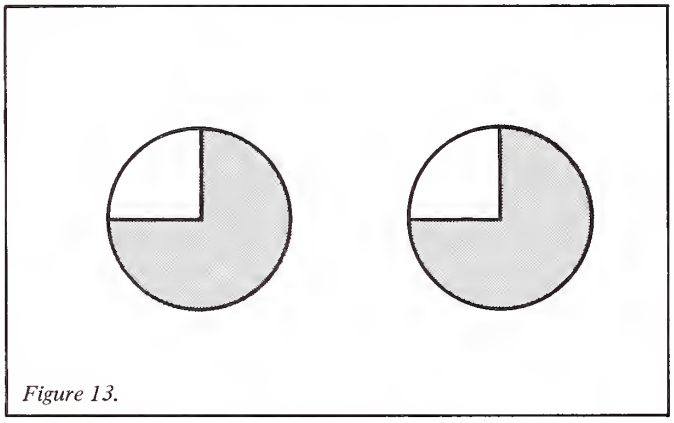


Figure 13.

remains successfully in an integrated situation. She is able to read (but very slowly, at less than 40 words per minute) with comprehension, mixes and plays with her school mates at an appropriate social level, and continues to make adequate academic progress with the assistance of a very understanding, sympathetic but realistic teacher. Her specialized programme enables her to work academically at her own pace, with adaptations to accommodate a moderate physical disability, and with an accent on verbalization, taping and listening skills. She remains a happy, emotionally stable little person, surprisingly independent in all areas except street travel, but still able to remain in a regular classroom in an ordinary school.

D. PERCEPTUAL PROBLEMS

A perceptual problem is not a visual problem, although I am constantly confronted by professional people who mistakenly think the condition is of ocular origin. "But he can't see the words!" they claim. Now, it may take an extensive ophthalmic examination to discount visual dysfunction, but perceptual problems as such are the result of a purely neurological condition.

Perception is the ability to mentally recognize and accurately identify what is seen; it is a function of the brain, not of the eyes. Some psychologists argue that we mentally put together the various factors in order to perceive objects — the yellow colour and the round shape, as fed to the brain from the retina, are interpreted in the visual memory as a yellow ball. Other theories of perception maintain that we are aware of the object as a whole, before we have an impression of its individual qualities. Both theories are difficult to confirm because sensation and perception occur simultaneously in adults, though not necessarily in children.

An object's shape and size, its position in space, and its relationship to other objects are all factors which aid perception. When a person sees a yellow ball and the yellow sun, through experience he can distinguish between the two. When further confirmation is required, other senses of touch and smell are brought into action. The ball feels round and smells of rubber — the sun feels warm.

The brain may make mistakes interpreting what the eyes have seen. For example, a person reading the phrase "we ran though the doorway" may not realize that the letter "r" is missing from the middle word, because the brain expects it to be there.

In nearly all cases of perceptual dysfunction, it is the brain's faultiness which results in incidents such as "word blindness", reversals and inversions in writing, mirror imagery when copying from a set pattern. The cause of this situation is unclear other than the fact that the brain does not interpret, decipher, record or retain correctly the exact image that the eye has "seen". There is a breakdown in the eye-brain transaction.

All the senses play a part in the brain's ability to perceive things — sight, hearing, touch, smell and taste, in that order of importance. In a predominantly visual environment, it is the sense of sight which provides the first, and therefore the most important input towards the brain's ability to perceive.

It must not be considered a *perceptual* dysfunction, however, when the imagery transmitted by unsound eyes is recorded by the brain as distorted, incomplete, hazy, etc. All functions are working to the best of their ability in spite of a sight impairment. The term "visual perception training" implies that a person may undergo tuition which teaches him to use more effectively, efficiently and economically what sight he already has. And this person may not necessarily be identified as "visually impaired" to gain benefit from involvement in this programme. Some people are just lazy users of their sight.

To assess just how effectively a person is using his sight, two thorough screening tests are recommended —

(a) the Marianne Frostig *"Development Test of Visual Perception"* which tests in the five areas of (i) visual-motor co-ordination, (ii) figure-ground perception, (iii) perceptual constancy, (iv) perception of a position in space, and (v) perception of spatial relationships.

(b) the Natalie Barraga 1982 Edition of *"A Programme to Develop Efficiency in Visual Functioning"* which plots the

milestones of visual development — (i) awareness of visual stimuli, (ii) movement control of eyes (discrimination of shape and colour), (iii) exploration, discrimination, use of objects, (iv) discrimination, and identification of pictures of objects, people and actions, (v) memory for detail; part/whole relationships; figure/ground discrimination, (vi) discrimination, identification, reproduction of abstract figures, symbols, (vii) perception of relationships in pictures, abstract figures, symbols, (viii) identification, perception, reproduction of symbols.

Any perceptual training programme is based on the normal developmental cycle of the youngster through his first 10 years of life, and uses as "norms" the acquisition of skills appropriate to a particular age. A child must score in all the sections of the Frostig Test, for example, at an appropriate stage of development before he is considered "ready to learn to read". Should any perceptual difficulties exist, these should be identified as early as possible so that a training programme can be instigated at the infant level, or earlier if this is at all possible. The earlier the start, the less entrenched the problem becomes and the quicker the recovery.

Visually impaired children will, because of a lower level of visual functioning, need perhaps a more intensive and carefully devised pre-reading programme to overcome, as far as possible, the misconceptions and distortions his eyes are making available for mental processing into image memory. It is for this reason that I find many of the visually impaired youngsters are not ready to enter a formalized reading programme for sometimes up to 12 months after his peer group has made a start — and some are even later! He should not be forced into a programme for which he is not fully prepared, just so that he keeps pace with his classmates, or because the teacher finds it inconvenient to accommodate a variation in speed of progress within her class. Neither should his level of intelligence be questioned — it is tempting to catagorize him as a "slow learner" when he is late in making a start because of imperfect vision.

Having diagnosed that you have a case for a visual perception training programme, the Natalie Barraga programme is highly recommended, though it is best supervised by a person trained and qualified to administer it. Sets are available at Homai College and each of the Visual Resource Centres. It is hoped that by making this programme more widely known amongst teachers and reading specialists, coupled with its inclusion into an infant programme, fewer reading problem children would reach intermediate and secondary school level. Both visually impaired children and fully sighted youngsters who exhibit characteristics of "lazy" visual perception, would benefit greatly from exposure to this visual training programme.

I should like to add a short note on the conditions of "perceptual blindness", "cortical blindness" and "hysterical blindness". In all of these conditions, it is assumed that there is nothing functionally or structurally wrong with the eyes or the ability to perform the act of "looking". This can only be assessed by physical (external) examination by an ophthalmologist. There is no detectable reason for the child's difficulties. Neurological examination may or may not identify the cause of visual dysfunctioning. Brain damage to the cortex may account for "cortical blindness", and psychological factors may explain "hysterical blindness", but many theories abound as to why this should occur. Therapy may relieve the condition, but by the time the patient has degenerated psychologically to the level of "hysterical blindness", the condition is usually very deep-seated and is likely to become a permanent state.

Cases are on record of a bump to the head or an emotionally traumatic experience causing sight to be restored miraculously, but these incidents are rare indeed, and many people suffering the three conditions above go through their entire lives without these "miracles" occurring. Medically and therapeutically little can be done to change their state. Teaching other sections of the brain to take over the functions of brain-damaged areas is a very new area of investigation. This study may well hold the answer to the problems of rehabilitation of such patients, but this remains some time in the future, and would require considerable research, experimentation and careful programming before it became an acceptable form of treatment.

E. BLIND SPOTS — CENTRAL SCOTOMA

Blind spots are areas of non-vision, and may occur in any part of the retina. The tiny junction where the nerve fibres of the retina exit from the eyeball via the optic nerve forms a natural blind spot in the normal eye. It is insensitive to light, because it has no rods and cones. To find your blind spot, hold this book at arm's length and shut your left eye. Look at the cross with the right eye, and move the book slowly towards you. When the dot vanishes, its image has fallen on your right eye's blind spot.

Contrary to common belief, a blind spot is not a black or hazy area in the visual field that is discernible in outline. It is just an area of non-vision — no colour, no shape, no detectable "edges". You are unaware that it exists, and objects disappear and reappear almost mysteriously as the images move into and out of the affected parts of the retina. Your student may identify the door, but fail to see the door handle and be feeling for it on the wrong side; he may be looking at the map of an island and not realize that it has a continuous coastline.

It is difficult for the fully-sighted to simulate what it might be like to have these blind spots in unnatural places. If you print a photograph with a hole in it, the white backing paper shows through the gap, and we know that a blind spot does not show up as a white area. Neither can we place a black dot on a picture, because a black spot is not what is registered on the retina with a blind spot. Even if an area is replaced with something transparent, this again gives the blind spot an image with "edges" on the normal

Figure 14.

retina. It is not even the same sensation to place spots on glasses or contact lenses, and look through them, because, again, this gives the simulated blind spot colour and outline, something that the true blind spot does not have. Taking the example of the door, a blind spot does not cause the door to appear distorted or out of focus; the handle just does not register as being seen — it is as if the door does not have a handle. The unsettling feeling arises when your intelligence informs you that a handle must be there somewhere, if only you could find it!

Central scotoma describes a blind spot that occurs in the central part of the macula, the part where clearest vision occurs, the part we use for most close-work, particularly reading.

It may be necessary to teach the child to angle the eye in such a way that the image of what he is endeavouring to see falls on the part of the retina that is actually transmitting impulses to the brain. To do this successfully, the site and extent of the lesion on the retina must be accurately plotted by the ophthalmologist, and the resulting field of vision chart made available to the educator who can then encourage the child to use the unscarred areas of the retina for close-work activities.

When viewing a larger area than that required for reading, it is an advantage to the viewer if he can use a scanning technique. This effectively moves the blind spot around so that it does not remain static in the one place. It can be anticipated that extra time will be needed for this scanning skill to be done efficiently, but it does become effective with practice, and minimizes the embarrassing situations which seem to occur all too frequently with scotoma sufferers.

It is easier to discuss the problem with a child who has enough intelligence to understand his condition, and what he has to train himself to do to overcome the difficulties. His age and maturity will also be an advantage. Depending on exactly where the blind spots occur in his field of vision, the child may experience "clearer" reading vision by concentrating his fixation point fractionally above or below the words being read. In rarer cases he may need to target slightly in front or behind each group of letters. If such is the case, you may wish to adopt the system of vertical reading as explained under the heading of "Hemianopia — Left and Right" earlier in this chapter, where a fuller and more complete diameter of the retinal area is made available for the reading activity.

Where a pupil focusses "off-centre" to look at an object, it must be understood that this skill is not a natural and automatic method of viewing, and may take a considerable amount of time and effort to master. Practiced consistently, and begun at a young enough age where these skills are more readily learned, and before less effective methods become too well established and harder to untrain or retrain, the habit should stand him in good stead for all his visual tasking throughout life.

I have noticed that some children have adopted this method by themselves, in which case the job has been done for you; but I have also observed many children who have not mastered the art, have been unaware that the practice improves visual tasking and have therefore failed as readers.

CHAPTER 4

SOME PRINCIPLES AND IDEAS

This chapter is a pot-pourri of topics which frequently come up in discussion with a variety of people, in a diversity of circumstances, and some at very unusual times of the day or in unlikely places — over a drink in the motel bar, on the phone, in the staff room or the principal's office, on the street or in the car-park, the sports field, on the plane, at an in-service course with teachers and parents, even via the postal service!

Each topic covered here would justify a full treatise if pursued to its deserved level of investigation. Many of these topics have, in fact, been the basis of considerable research by eminent educators, and any teachers wishing to be better informed on any of them are encouraged to seek additional information from whatever source is available to them.

Many of the ideas expressed in this chapter may not necessarily fall neatly into line with what other writers have expounded. Most studies I have had access to have been from overseas sources, and therefore not wholly applicable to New Zealand policy and practice, or in line with the Foundation's philosophy on integrating a visually impaired child into the regular classroom environment. Much of what I say here is entirely my own, being ideas and thoughts based on what I have observed. Neither time nor opportunity has enabled me to study scientifically any of the discussion points. Hopefully, someone, sometime may provide analytical data on any or all of them.

Using the word "Handicapped".

You may have noticed that I have avoided using the word "handicapped" in this book when discussing the child, his performance, and his eye problems. Although this is by personal choice, I find that there are many specialist teachers and professionals who think and talk similarly. "Handicapped" seems to carry with it connotations which are not very frequently applicable or accurate. For this reason, I refer to the pupils I visit as being "visually impaired" or having a "visual condition". Their performance academically, intellectually, socially and psychologically is in no way any different from their fully-sighted peers, and I cannot justify describing them as visually "handicapped", even though they may use forms other than print as their medium for reading. Many of the children themselves do not consider that they are handicapped, and if they possess such a positive self-image, who are we to persuade them otherwise? I believe that we are in the business of ensuring that a visual impairment does not develop into or remain a handicap through lack of positive intervention optically and educationally.

Any child whose performance indicates that the lack of visual input is not being compensated for through any other avenue may, then, be considered "visually handicapped". He should then receive very specialized training as quickly as possible, to rectify the problem. This is done by bringing him into Homai College for a period of time, or to bring in the services of the itinerant teacher who can conduct training sessions on the school premises on a weekly or regular basis. I prefer the latter course if the problem can best be resolved by this level of support, and if the pupil is within realistic travelling distance from a resource centre offering this service. Minginui and Karamea should illustrate the problem of accessibility that is sometimes experienced by the itinerant teachers.

Referral to Appendix A of this book will indicate the levels of performance required of any child before he is placed in an integrated situation, a standard of personal achievement which gives him a realistic chance of succeeding in that placement, with appropriate levels of support from involved agencies.

With the current improvements in the types and varieties of optical aids prescribed by ophthalmologists, together with the development of thought in the educational approach in providing suitable programmes for the visually impaired students, it is hoped that the visual limitation of any particular pupil does not prevent him from reaching his full potential as an ordinary child in a regular classroom. The Homai College Advisory Service handout *"Guidelines for Classroom Teachers"* contains the statements requesting the teacher not to view the visual limitations of the child as being of paramount importance. Many children have unfortunately been "taught" to be handicapped, and treated as if they were handicapped; their visual limitation has become the central focus in their lives because they were responded to as if the visual loss overruled everything else. It is very easy to see the disability — it is harder to see the personality behind it. Provide a setting for, and expect a level of performance from your pupil in terms of his scholastic attitude and his other attributes, and not in terms of his visual disability. Differentiate the effects of limits imposed by poor vision from those that have their source in other causes such as emotions, intellect, hearing, attitudes and background. Do not let the child exploit his visual limitation for special treatment and privileges. This way, he will be accepted more readily by his peer group, and consider himself as just one of your pupils. Treat him basically as you would any other child in your class, and as naturally as is possible. Any concessions and adaptations should be considered as a natural state of affairs, kept in a low profile and absorbed as naturally as possible into the normal routine of the classroom.

Visual Impairment = Mental Retardation?

I am continually perturbed at the number of children who have, for obvious reasons, been identified as being visually limited and have, on this information alone, been placed in a class of slow learners, or worse still, been catagorized as "intellectually retarded" and receive an educational programme at a special class level. I can cite you half a dozen cases of children who have begun their school life at an I.H.C. centre, but have now attained an educational level that enables them to sit and pass subjects at the School Certificate level. Reassessing the child's natural abilities and potential, coupled with correct prescriptions for optical aids, enhanced with curriculum adaptations where necessary, plus the efforts of an understanding teacher, enable some wrongly categorized children to achieve their true potential.

Being visually limited does not automatically mean that they are *slow learners*. Visually impaired children may be slower at performing visual tasks, which includes reading, but they must not erroneously be considered

special class or even second-class pupils. In many instances, their mental faculties remain intact. They may be slow readers, not slow learners. A visual condition may well cause *educational retardation;* it will not cause *mental retardation*. There are only a few instances where the visual-intellectual link is from the one cause — brain tumour, brain damage, rubella syndrome, Down's syndrome and diabetes — but in no case does the visual dysfunction *cause* the pupil to become intellectually subnormal.

The reason that I have been given that some partially sighted child has been placed in the special class is the smaller teacher-child ratio available in this area. My argument is that to a normal, intelligent child this environment is not as stimulating educationally or socially as a regular classroom would be. He doesn't get as many opportunities to develop his competitive nature, his ability to act independently of all-too-readily-available assistance, to find self-confidence in the abilities he already has, and to compete in a fully-sighted world using his own resources. Educational levels at the special class strata may also be quite inappropriate to his natural ability.

It is hoped that with the support that is available to the regular class teacher in terms of knowledge and understanding of the visual conditions and what may be done to cope with them, more visually limited children can experience the normality of working in a regular classroom, rather than be relegated to the special class. Teacher-aide hours, regular visits from the itinerant teacher from the nearest Visual Resource Centre, support from the psychological service and access to information as is contained in books like this one, should all be available to the regular class teacher so that her task in supporting a child with a visual dysfunction is made that much less onerous.

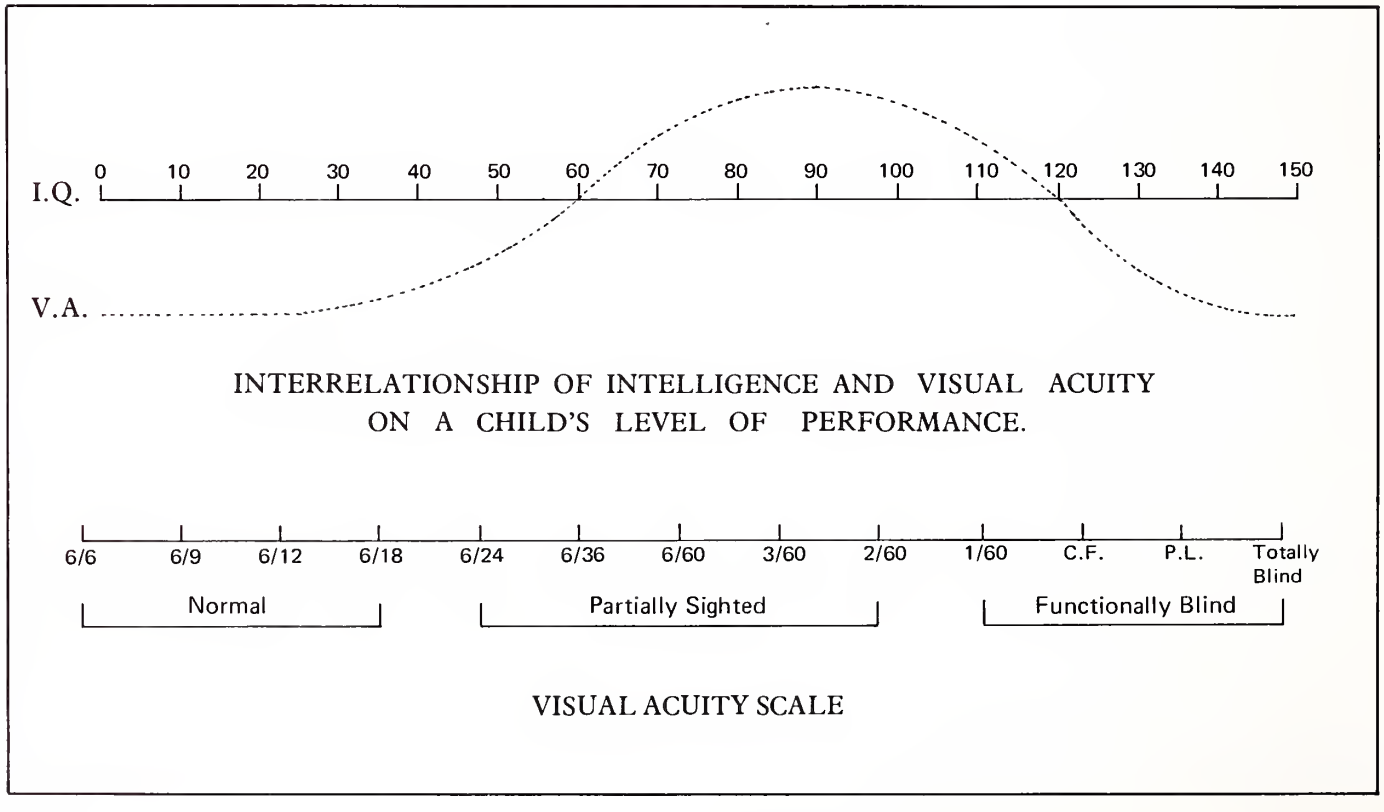
In determining the class placement most suitable for any child, his level of intelligence should be considered as more of a determining factor than his visual acuity. It would be safer to disregard the visual performance altogether — at whatever level of intellectual performance the child functions best, the appropriate support to meet his visual needs can be arranged.

In my experience, performance levels at both extremities of the I.Q. range (below approximately 60 I.Q. and above about 125 I.Q.), with a few exceptions, are little affected by a visual condition. A child can be fully sighted, partially sighted or totally blind and his performance remains fairly standard and appropriate to the intellectual levels of the peer group. Visual dysfunction affects a child's performance between these two limits, when adaptations to the school programme are crucial factors in the child's ability to cope. And it is towards this group of children that the bulk of the contents of this book are aimed.

Flipping the coin to the other side, it is a possibility that a low intelligence child may have an eye condition that has been disguised by his depressed performance level. The teacher is invited to refer to the checklist found in the chapter "Classroom Screening — Identifying a Child With Visual Dysfunction".

Sight as a "Status Symbol" to the Visually Impaired

Observe a group of visually impaired children together, and it will not take too long before the children with the most effective level of sight will emerge as the self-selected "guides" of the group, particularly where mobility skills are required. The intellectuals and planners tend to come from the group of more severely visually limited, but the "doers" are frequently those with the better vision. They become the leaders when physical activity is involved. The blind child creates the motivation for his mates — "Let's go to the shops and buy an ice cream" — but it will be the child with the most vision who leads him to the store, either walking beside him "steering" him from that position, or actually being one pace in front with the purchaser "in tow".



INTERRELATIONSHIP OF INTELLIGENCE AND VISUAL ACUITY ON A CHILD'S LEVEL OF PERFORMANCE.

VISUAL ACUITY SCALE

When walking, the "functionally blind" will quite happily be led by the "partially sighted", and even the totally blind will feel more secure travelling with someone who has vision at a C.F. or P.L. level than when travelling on his own. He feels that the small improvement in vision provides a dimension to safety which he does not possess.

I think that an instinct exists amongst the visually impaired that an increase in functional vision parallels an increase in safety levels. This self-selection is often done without discussion (it appears to be done instinctively), and once the roles have been established as to who is the "guide" and who are the "entourage", there appears to be no challenge to change the order while that present group remains intact. But should the group expand or decrease in number, a reshuffling may occur, particularly if the erstwhile "pilot" moves away or is superseded by a person with a higher level of vision.

It appears to confirm the feeling I have had over the years, developed through discussion with people in all ranges of visual impairment, that the partially sighted view the more visually able to be in some way better equipped than they are. It perhaps, also, explains my frustration with fully sighted students when I see the herculian efforts many visually impaired pupils drive themselves to, to put themselves on a par with their seeing peers, and I compare that to the apparent lazy attitudes I witness as the effort produced by "normal" students who seem quite unconcerned to be under-achieving! The visually impaired student seldom sees himself as bettering the performance of his fully sighted peers, whereas in fact he may be well ahead in terms of application, attitudes and general performance. They seem to miss out so frequently on the "sweet smell of successs" in a fiercely competitive world, and their colossal efforts are not fully appreciated by the rest of their social group. But their consistent application to work gets them to a far higher level of performance than they would otherwise have achieved.

With few exceptions, even amongst the totally blind, there is this feeling that the fully sighted students *should* do better at qualifying in any area than the visually impaired; educationalists in the visually impaired area readily agree that it requires twice the amount of study effort for the partially sighted to merely keep abreast of his fully sighted counterpart, and unfortunately this concept is mirrored by the students themselves. It is the low vision student himself who tends to elevate the better-sighted to the higher position (in terms of general performance), and this attitude carries on into adult life to a greater or lesser degree. They place such great value in "having sight", the very commodity they are denied and which we, as fully-sighted "observers" on the outside of their world, do not see as being as important to "success" (in all of its ramifications) as they perceive it to be. Perhaps this is part and parcel of the "psychology of blindness"?

It is my desire that many of the sight impaired students may re-evaluate themselves by comparing the disadvantages of having a sight loss, to being lazy, anti-social, dishonest, selfish, un-cooperative, etc. These characteristics are so much more handicapping to achieving success, happiness and self-fulfilment than loss of vision — if only they could see it that way. And who is best to bring about the change? Us as educators, or the pupils themselves, by developing a more positive self-image through spontaneous discussion and achievement of the goals of self-realization? Paralleling the emergence of feminism and equality for women, it may require one of their own number to force the issue into open forum for full discussion and analytical investigation, with the view of providing self-education and support of their own kind. I hope that one day this self-help movement eventuates. I should also love to assist in its growth and effectiveness.

You may well query the reason why this topic is raised in a book designed for teachers in a regular classroom, rather than educators of the visually disadvantaged. Since

my observations point to the fact that the syndrome of acknowledging "sight as a status symbol" appears to be more prevalent amongst visually impaired children in isolation rather than in larger groups, its inclusion here is to draw the teacher's attention to its existence, and so be prepared to handle it as and where it occurs in the classroom or playground context.

The Need to be Accepted and Understood

Being "accepted and understood" is a prerequisite for the happiness and success of any student in whatever placement he finds himself — but it is even more crucial for a child who may be seen as being "different" or "limited", and who has special needs or requires special equipment to enable him to function up to his true potential, and thus participate in a similar or parallel educational programme to his able-bodied peers.

It is readily accepted that the visually limited child is first and foremost a child, with all the emotions, needs, developmental stages and problems of the fully sighted child. He may, however, need special emphasis in some areas of his development (visual training, self-acceptance, organizational skills, independence, personal relationships, etc) in order to lessen the gap between his level of performance and that of his peer group. As is explained in the previous section of this chapter, he may need to apply twice the effort merely to keep pace with the rest of the class.

It is not unreasonable, then, for some of the students to feel that they are battling alone, particularly if they are the only visually impaired student in a school of 1000 or more. We are very keen to place the partially sighted (and sometimes the totally blind pupil) back into their home schools. They are very keen to go initially, and enthusiastically launch themselves into the task of carving their own niche into the school community. For the most part they succeed remarkably well, and only one or two have mentioned, almost casually, the feeling of isolation they experience on some occasions. Others, I feel, have had the same sensation, but have failed to report it. It is not a social or physical isolation so much as a desire to have access to another similarly disadvantaged student with whom they can relate, share and discuss their feelings from time to time. For the greater part of their school hours, they present and function as a person who is coping with the whole system quite well, albeit with the support and adaptations which are in operation in their programme. But they would like to meet with someone who understands, appreciates and perhaps has even experienced their particular stresses, pressures, frustrations and battles. The desire is to meet in secret, away from public notice, so that the image they publicly present to their classmates remains intact and does not exhibit "chinks in their armour".

The security is there, the self-confidence is active, the independence is still growing, but it needs to be positively bolstered on occasions, in a form and by person(s) which are peculiarly "special" to the visually impaired student.

Damage to his self-image (which in turn affects his attitudes, determination, co-operation, dedication to tasks, etc) can very easily occur through a hasty and unfair criticism in an unguarded moment, and his retreat behind the statement "But you (or they) can see better than me!" is about his only means of expressing the cause of all his problems as he perceives them. At that moment, he feels vulnerable and exposed to pressures beyond his visual ability to control. Considerable care and tact would need to be exercised in this situation. He needs to know and be re-assured that his personal relationship with both peers and adults remains intact, and though he may be different from other children in some ways, there are solutions to all his problems, and he must play his part in helping to solve them. He must also accept that problem-solving is not instantaneous, that other people may be, or become involved, and that the solution most applicable may not be the one that favours him alone. The way he approaches and handles episodes like this at school will better prepare him to cope with similar experiences in the sighted community at large, when he leaves school to join the work force.

I should like to acknowledge here the very great contribution to student welfare from the Guidance Counsellors I have worked with in many of the secondary schools and colleges throughout New Zealand. I have found them almost to a person, to be very understanding and caring people, able to disseminate amongst the staff all the factors concerning any of the children I have come to visit, and in general to act as receivers and dispensors of information from me to the student(s), or in reverse, from the pupil to me. One went so far as to organize a "friendship roster" for a visually impaired child, newly arrived at the school and who was having difficulties relating to a peer group and being accepted by them. Very thick lensed glasses made this scholar the butt of much teasing with a tendency towards ostracization. The roster, bringing her into contact with selected and volunteer classmates one at a time rather than en masse, also spread the task more evenly through the peer group. It was better and fairer than one child being delegated to be her "special friend"; that one child runs the risk of being isolated as well, and soon tires of the responsibility of seeking to integrate the impaired pupil into the social group on her own.

This system of rostering friends has been employed in many schools where the problem of acceptance has been encountered, and has worked very well until the new student gains the confidence to conduct his own social integration. This procedure, if coupled with personal counselling to the integratee on "how to make friends and keep them", and to the group on "how to acknowledge, accept and live with personal differences", better sets the stage for harmonious co-existence.

For a child to feel truly accepted into a group, the differences and difficulties of his day to day routines have to be appreciated, though the question remains on how much of his personal information should be made generally available to all-and-sundry. This may well depend on the circumstances, the disabled student's wishes, his ability to present his own case to the peer group and the level of interpersonal relationship he has been able to build by his own efforts. Many reasonably-able visually-limited children go to great lengths to become "anonymous within the group", and may even deny that they have anything wrong with them. It is easy in this case to keep a low profile in the type of support that is offered, and any curriculum changes remain completely unobtrusive. One inherent danger exists here, in that the child may be further handicapping himself by his own desires to be unrealistically "normal", and avoiding seeking assistance that he really needs.

It is more difficult to maintain anonymity when specialized equipment and physically obvious support is in evidence, and to hide the fact that difficulties are being experienced. With a totally blind child, of course, the situation is on full display. The evidence of support would

appear to be directly proportional to the level of visual acuity — the more able can "get away with it" more successfully. Some strength in personality and character is exhibited by those students who are unashamed of their limitations, and honestly (but without too much fuss) issue a challenge to be accepted in their own right. Happily this is the more common approach adopted by the integrating student, and results in the most successful integration cases. The times when these pupils require moral support are few and far between — but do occur, and the adjustment of the pupil to the peer group is accomplished quickly and easily.

Occupational programmes, vocational training, tertiary education and extended educational training should be based and planned on intellectual levels rather than visual acuity. As was stated earlier in this book, the type and extent of support that is required for any student is available at whatever level he is working, both at schooling and job placement. Therefore, the options that he chooses at secondary school level should be selected on his interests and ability, and lead towards preparing him for his vocational ambitions.

The role of the school psychologist should not be overlooked either, in dealing with problems of integrating children with visual needs into a sighted community. It is of vital importance that the psychologist is informed of the existence of a visually impaired child in your classroom, the child's past educational history, his eye condition and the ophthalmic prescriptions (if any) that are essential to his visual performance. The psychologist will need all this information for his own testing procedures as well as his counselling and supportive contact sessions with the pupil, should these be necessary. Most psychologists will have been in contact with, or at least know of the existence of the support personnel associated with the Royal New Zealand Foundation for the Blind, and will be in communication with us should the need arise. On more than one occasion, it has been the Psychological Service who has acted as co-ordinator for case studies, in-service courses or special meetings where all involved agencies and personnel have been brought together to plan future programmes for visually impaired students, or to accurately detail a child's true performance potential. Their contribution, like the Guidance Counsellor's, can be very enlightening.

It is difficult, in fact it is virtually impossible, for a fully sighted person to understand what it is like to suffer a visual loss. We cannot place ourselves inside a visually impaired child's head, look through his imperfect eyes, to see how he views the world. We can simulate many of the visual handicaps (some are explained in earlier chapters of this book), but we cannot fully appreciate the psychological effect that this is how we will be seeing for the rest of our lives, a fact that visually limited children have to come to terms with if they are to be considered "well adjusted". We know that we can remove the simulation when the pressures become unbearable — they cannot. Understanding their feelings and limitations takes a very special kind of person. Empathy amongst the afflicted is a very special commodity, and sometimes very hard to find. It is a rare combination to have a visually impaired pupil being taught by a teacher who has, or has overcome a disability. These are the teachers who truly appreciate and honestly understand the debilitating effects of a handicap. Able bodied teachers can only do their best, through being fully informed, apply insight and have the experience of coping with a visually disabled pupil in their classroom.

Teacher Expectations of a Child's Performance

Having checked in with the lady in the school office, and met the Principal, I knocked on the classroom door. I introduced myself to the teacher and explained the reason for my visit.

"Oh, you've come to see little Jason," she responded. "Such a good wee boy, very well behaved, and no problem at all. He's a pleasure to have in the class."

On entering the classroom, I found its members industriously writing their sentences beneath their own drawings, while Jason was sitting quietly in the corner, on his own, playing with large wooden blocks.

"Doesn't Jason join in with the class activity?" I asked.

"Of course not — he can't! He's nearly blind!" came the reply.

Now , while this may appear to be an extreme case, the principle behind the attitude is common enough. All too frequently, a teacher expects that her "poor little blind pupil" is incapable of performing many tasks she sets for the rest of the class. She expends considerable effort and energy devising alternative activities to keep him occupied. Should the same amount of energy, or perhaps even a comparably less degree of effort be rechannelled towards his fuller participation in a group or class activity, then the time would have been more profitably spent.

The underlying purpose of this book is to indicate to the teacher that the visually impaired child is capable of participating, and indeed, able to participate in an ordinary classroom programme. I want to dispel forever the idea that there is such a thing as a "poor little blind boy" syndrome except as a figment of the imagination.

Psychologists and educators acknowledge that most children will rise only to the level of expectation exhibited by the teacher (or the parent). If that is high, then the pupil has something to aim for and challenge him. If it is too low, he will not be extended to his full potential, and may soon learn to quote the teacher/parent by saying"That's too hard

to do because I cannot see", and thus use that as an excuse to avoid doing unattractive tasks.

The teacher's expectation of what a child is capable of achieving, becomes more realistic through the availability of the correct information of the child's visual condition, knowing to what extent the disability can be alleviated by the employment of visual aids, finding out in what areas to make curriculum adaptations and through the development of positive self-image and independence within the child himself.

Several teachers have expressed delight and surprise at what visually disabled students can accomplish. Many of the pupils continue to surprise me! And I quote the case of a boy with 2/60 vision in one eye only, who remained in an integrated setting for his entire educational life, who succeeded in sitting and passing his University Entrance examination with no other concessions for the exam than the provision of extra time. I believe his success is, in many respects, due to the teachers and his parents who recognized his abilities, convinced him of his own capabilities, and encouraged him to "get on with it". My involvement started at the beginning of his secondary education, but "keeping a watching brief" was about the extent of my intervention, apart from supplying him with a typewriter and a reading stand. Checking with the ophthalmologist, it was confirmed that glasses and optical aids would provide only minimal visual improvement apart from a miniscope for distance viewing. He was able to read N8 size print from 5cm distance at a rate of 160 words per minute (with one eye), and of course, a higher than average intelligence helped considerably.

Even totally blind children fully and successfully participate in a regular classroom programme. I find no reason to suspect that children with usable vision cannot function just as effectively.

Jason's case illustrates one extreme of teacher expectation. It is perhaps just as extreme to be unrealistically and immovably unaccommodating of physical disability. The "happy medium" is what is most beneficial to the student, and in the long run, more rewarding to the teacher in terms of job satisfaction and accomplishment.

If a teacher accepts the idea that an individual can "learn to see", and therefore can increase his visual functioning, then it is more than likely that this attitude will be conveyed to the pupil through the teacher's enthusiasm and encouragement. Certainly the teacher has many opportunities during a working day to demonstrate the effectiveness of encouraging a better use of vision by putting greater emphasis on "looking" and "seeing". This should occur both indoors and outside, since visual tasking takes place consistently during all waking hours, in both structured and unorganized periods.

Again, there are some teachers who consider speed of learning to be more important than "slow but steady" progress. They see **time** as the commanding factor, and fail to appreciate that the quality of the learning is of more lasting value, and that skills learned for visual tasking in the classroom overflow to other settings beyond the school environment, and will last, hopefully, throughout life.

CHAPTER 5

CLASSROOM SCREENING

Identifying a Child with Visual Dysfunction

It is becoming more likely these days that a teacher in a regular classroom will encounter a child with learning difficulties because of a visual disorder. These pupils will fall into two categories — those who have already been brought to the notice of the Royal New Zealand Foundation for the Blind through ophthalmic notification, become registered and receive the services of that organization at school level; and those children who have not. The former group will be dealt with elsewhere in this book. The latter will be given some attention here.

In this age of advanced technology, sophisticated screening techniques and ever-expanding knowledge, it is still surprising to me how many children slip through the screening "system" and remain undetected as low-vision students. I am not referring here to the children who have a mild and/or a correctable visual condition, have been seen by an eye specialist, have glasses and visual aids prescribed and have vision restored close to normal after correction. I am referring to a child whose visual problems have **not** been identified as such by anybody, but have erroneously been placed into the category of "slow learners", "educationally retarded", "lacking positive attitudes", "low in ability", and "lazy" or "dumb". In many such cases, the categorization should be that he "does not see well enough to learn in the conventional way". This decision can be reached by some careful observation by the teacher in the classroom. An undetected eye problem is more likely to occur in the more remote areas and in country settings for a number of reasons. Variations are more readily tolerated in country districts; distance from urban facilities and specialists is greater; comparison opportunities are less frequent because of smaller school rolls; teachers in small schools are more adept and more prepared to provide a personalized programme for single pupils within the one class (more evident in sole-charge schools, where the whole range of ages and abilities occupy the single classroom). For whatever reason, some child's learning problems fail to be linked to an undetected eye condition.

In today's society, many visually impaired children **have** been identified by the general practitioner through knowledge of the family genetics, through ophthalmic testing, through thorough screening programmes by public health nurses visiting schools and homes, or simply by someone saying that they don't think a particular child sees very well (which infers that somebody else checks out this observation). To help teachers identify a pupil who previously had caused some concern in the learning situation and who **may** have a visual problem, the following check-list is made available. Identification and remediation at an early age could ensure that the pupil is not retarded in attaining his educational milestones, and he can enter adulthood (and society) at a level more commensurate with his natural abilities and interests.

The following check-list is aimed at making the alert (and concerned) teacher aware of areas of vision, or functions of the eye, that may have hitherto been overlooked. Take time to observe if the child —

1. appears sensitive to light that in normal circumstances would be considered acceptable, causing watery eyes, red-rimmed eyes, causes pain or aching or burning sensations, or the child employs avoidance techniques to working in bright surroundings but works more happily in darker areas of the room.
2. covers one eye with his hand or closes it for sight tasks, preferring to see with the other eye alone.
3. juts his head forward when observing things — this characteristic is often accompanied by frowning and accentuated concentration mannerisms.
4. attempts to brush away blurs or rubs his eyes to apparently clear his vision when doing close work or fine work.
5. is irritable, blinks often or avoids altogether doing close or fine work.
6. has frequent eye irritations — red-rimmed, weepy, swollen or puffy eyes, or susceptible to sties.
7. is unable to focus easily because the eyes are "crossed", or not looking straight ahead, or roll around, or wobble continuously (the latter may be more obvious in moments of pressure, tiredness, excitement, worry or nervousness).
8. tends to hold print or objects unnaturally close to the eyes.
9. tends to move clumsily, tripping over small things or bumping into furniture or fittings, stumbles up or down steps and curbs, can't locate smallish objects dropped on the floor.
10. complains of dizziness, headaches or nausea after doing close work for a time.
11. complains of blurred vision or double vision — frequently the statement is "I can't see it properly".
12. loses interest quickly in the more difficult sight tasks containing fine detail, or small print or complicated visual information.
13. holds body tense and employs unnatural facial grimaces for either distance or close work.
14. employs unusually large or heavy black imprint in written work (which is often untidy and not uniform in appearance), or pressing excessively hard on the paper, or going over the same letter several times to make it blacker.
15. exhibits difficulties in reading (like losing the place too frequently) or in other school work requiring the eyes to be brought close to the resource material.
16. has difficulty in sports participation, particularly those using a small ball in flight.
17. appears unaware of distant objects, or takes an unnaturally long time to locate them and focus on them.
18. seems unable to distinguish accurately some or all colours.
19. performs as an "under-achiever". This is a very vague area to define, but the child may exhibit a few

indications in his general performance. A bright child may be coping very well at Junior school levels but "tail off" markedly when visual material is presented without enough verbal commentary (e.g. chalkboard work, charts, maps, etc). The child's feeling of inadequacy is manifest by behaviour of attention seeking, easy distraction, or withdrawal.

Any one, or combination of the above points does not necessarily mean that the child is deemed "visually handicapped", but should you have any misgivings, do not attempt any remediation yourself at this stage. Through your principal, seek the help of a qualified eye specialist who will either confirm or dispel your concern. Should the situation arise where you have any doubt as to the child's visual ability, it would be advisable to talk with your principal first, explaining your apprehension. On his advice, contact should be made with the parents to see if they are, firstly, aware of any discrepancy in their child's visual performance, and secondly, if they would be prepared to have his vision checked by a qualified ophthalmologist. Be guided by the eye specialist's findings, but make him aware of your observations and concerns in the classroom and playground situation. He may confirm that your pupil does **not** have a visual problem, and therefore the child's learning and performance difficulties may stem from a completely different cause.

In the eventuality that your pupil **does** have a visual condition that requires a modification of your presentation of school tasks to him, the chapter on CLASSROOM PROCEDURES is designed to cover some general hints on classroom procedures. Further chapters detailing the support you could expect from the Royal New Zealand Foundation for the Blind and its several services to schools are also included, so that you have access to trained and experienced personnel to assist you in providing a suitable programme for your visually impaired student, simply by asking for help.

CHAPTER 6

CLASSROOM PROCEDURES

Helping a Child with Visual Dysfunction

A. GENERAL GUIDELINES

When you first found out that you were to have a visually impaired child in your classroom, your mind most probably did some mental gymnastics. PANIC!! You compute some avoidance questions — "Oh no! Not MY Class!", "I don't know what to do!", "Why isn't he educated in an institution?", "I don't know anything about this kind of education!", "I'll resign!" Having worked your way through the various soul destroying and self-examining questions, you begin to think a little more constructively by asking yourself questions like "How can I best handle this challenge?", "How can I help this child learn in spite of his handicap?", "Where can I get help?". This would indicate both acceptance and acknowledgement that help is available — both positive attitudes. You are not fighting a lone battle, neither are you the only teacher in this situation.

Visually impaired children are very much like any other children in that they have the same strong desires to take an active part in the family and social environment in which they find themselves. And this includes a class situation. A gradually developing educational philosophy over the past two decades has demonstrated that a visually impaired child can benefit greatly academically, socially, emotionally and physically from attending his local public or private school. One of the chief reasons for this development is the desire of parents to have their child at home where he can experience the warmth of family life and share in its realities. Through attendance at the neighbourhood school, the visually impaired child develops and matures while sharing the same opportunities and challenges as his sighted classmates. The day by day living of sighted children with a visually impaired child is one of the most effective means of breaking down misconceptions and prejudices about visual handicaps.

The extent to which a partially-sighted child can adjust and achieve satisfactorily in a regular classroom is an individual matter and dependent upon several factors. They include, amongst others, his visual acuity, his visual ability (and I'll explain this term more fully elsewhere in this chapter), his interests and capabilities, his natural abilities, the degree to which he is able to orientate himself to a diversity of classroom activities, the size of the class in which he is placed, and the amount of attention the teacher is prepared or able to give him as one of the several steps designed to help compensate for the handicap of poor vision.

I must state now, that in preparing this material, I have found it extremely difficult not to over-generalize, or to over-simplify. These "guidelines" are presented only as a suggestion, and what I include here will certainly not apply to ALL visually impaired children, nor to all teachers.

As teachers, *your* responsibility to the atypical child in your group is the same as your responsibility to any other child. You should help him develop in all areas — academically, physically, intellectually, socially and morally. A teacher must take every child where he is and lead him as far as the limitations and potentialities of both the child and the teacher permit. *My* responsibility is to help you to achieve this ideal.

Try to remember that if you are a good teacher of sighted children, you can also be a good teacher of visually impaired children. Teaching and learning processes are fundamentally the same, no matter if the student is fully sighted or not. But some adaptations to the curriculum and/or the method of presentation may be necessary.

It has been stated elsewhere in this book that not all visual conditions can be alleviated by prescribing glasses or visual aids. The same may be said of supplying large-print editions of readers or text-books. Many eye conditions do not need this departure from normal print, and it becomes just a matter of accepting and accommodating the child's performance in sight tasks, allowing for his slower speed in reading, and understanding that he will, from time to time, come across some work which is difficult or even beyond his capability. It is up to the teacher to keep these situations to a minimum, or devise some method of presentation that allows the visually limited child to participate in at least part of the lesson. Discuss these situations with your visiting Adviser or Itinerant Teacher.

The Teacher's Role

The role of the regular class teacher is significantly important. The task of working with a partially sighted child presents a challenge in that the teacher's attitude towards the child, coupled with an understanding of the effect that the visual defect has on the child's capacity to learn and adjust, will determine the ease with which the teacher can help to create more meaningful learning experiences. The resourceful teacher must be alert to every opportunity to bring about active participation on the part of the child in those particular aspects of a learning situation which will best promote his growth and development.

Regular classroom teachers who have already had experience with visually limited children (and the number is growing!) are quick to say "Don't panic!" The partially sighted child adapts surprisingly well to circumstances as they arise, and is eager and able to do most of the same things as done by the sighted child when given the opportunity. If you are natural and relaxed, the child will develop in a natural and relaxed way. A pat on the head or a gentle arm around the shoulder says a great deal to a visually impaired child. Help him feel that he belongs to the class, *but give him no special privileges.* A visually limited child can learn that lack of sight does not absolve him from the need for discipline. Allow him the opportunity to grow in independence, just as you do other children. Before long the entire class will be talking about how proud *they* are of his developing independence, self-confidence and competency. Address him by name. Many eye conditions make constant eye contact between speaker and listener difficult to establish at any particular moment — make sure that you have his attention before speaking to him.

The standards of grading should be the same for the partially sighted child as for any other child. Too much emphasis can be placed on his visual handicap rather than on the other normal abilities of the child. To have a visually impaired child in your class can be a fine experience both for you and the other children in the room. Relax and enjoy it.

The Classroom Setting

The physical setting of the classroom should be such that it enables the teacher and the child to work comfortably and efficiently. The following suggestions are useful in providing a desirable environment not only for the child with poor vision, but for all the children in the class.

1. Arrange the seating and classroom generally so that the child does not suffer fatigue by having to face the light directly.
   (a) The teacher should not stand against the windowsills while talking to the class so that the child has to look towards the brightness of the windows — he would see you only as a silhouette without any facial expression.
   (b) Do not make use of the spaces between and under the windows as the child will then be forced to face the light in his attempts to see what is there.
   (c) Allow the child to sit where he has, what is for him, the best light. This is so that charts, bulletin boards, chalk boards and other stimulus material are readily visible and free from glare. Some eye conditions are such that these children will work best where the amount of light is not too high.
2. Eliminate glare.
   (a) Avoid having highly polished surfaces on desks and other work areas, as they create glare and discomfort.
   (b) Glass-covered pictures, decorations and similar objects on walls may reflect sunlight directly into the eyes if the sun shines directly onto them.
   (c) Eliminate clutter and crowding on walls as this tends to confuse and cause fatigue. Select pictures that are clear and colourful, and avoid those with too much "fussy" detail.
3. Seats should provide maximum comfort so that the child's position in the seat is such that all materials used are at a comfortable eye level. A seat or desk that is too high or too low, too narrow or too broad, can cause much general physical discomfort as well as eye discomfort. Corrective steps may be taken by —
   (a) the use of moveable, adjustable, dull-surfaced, tilt-topped desks;
   (b) providing a reading rack or adjustable easel, properly placed so that material may be brought up to eye level.
4. Lighting
   (a) Make the most of the room's natural illumination by adjusting shades and blinds for maximum comfort. Use additional lighting to supplement the natural lighting when necessary.
   (b) Light entering the room should fall so that shadows do not cover work areas.
   (c) Usually light coming over the left shoulder is best

for righthanded children, and vice versa.

(d) Avoid casting your shadow over the child's work space by bending over him while working with him. Sit opposite him or on his "shadow" side.

(e) Avoid the use of heavy curtains, the placing of plants, moveable cupboards or other large objects which could cut down the amount of light coming through the windows.

(f) If the child shows a preference for working very close to the work surface, this should not be discouraged. Ensure that his head does not cause shadowing, by positioning the light source at a more oblique angle to his work.

General Provisions

1. It is of the utmost importance to obtain the recommendations of an eye specialist and to follow them.
2. Glasses and all reading aids should be kept clean and properly adjusted, and worn constantly if this is recommended by the optometrist.
3. Eye-rest periods should be provided by varying activities.
   (a) Stress oral approach whenever possible; oral drills may be alternated with written work and reading activities so that all the children in the class can benefit from the eye-rest periods.
   (b) Alternate chalkboard work with seat work.
   (c) Avoid excessive and unnecessary reading, particularly when it contains fine print.
   (d) Provide creative or freehand art work between activities that require intensive close eye work.
   (e) Encourage children to rest their eyes frequently by closing them, or by looking away from close work to some distant object or scene.
4. Writing that is clear and large should be emphasized.
   (a) Board work should be in large, clear writing that is not too crowded. Yellow chalk on a dark green board gives the best contrast. Place all work on the cleanest, best illuminated, glare-free portions of the board.
   (b) Provide the child with large, soft chalk which makes a broad, heavy, even line for his own board work.
   (c) Allow the child to write larger than average, and if manuscript writing is easier for him, encourage him to use it. Writing periods should be kept brief.
   (d) Pencils with soft, very black lead, making broad, clean lines are easier to use, and the writing easier to read back.
   (e) Pens making a broad, heavy line are desirable. Felt-tipped pens and spirit markers are preferable to ball-point pens or school ink.
5. Children with limited vision should be trained to be "ear-minded" as well as "eye-minded". Where necessary, substitute manual and auditory experiences for visual tasks.
6. The services of a reader should be employed if such a service is recommended, and will contribute to a higher level of achievement and adjustment.
7. Supplementary material in clear-type books which may be read with less fatigue than books with closely crowded print should be provided when recommended.
8. In the standardized test situation, if these children are tested by using the same procedures used with other children, it may be expected that in some instances the results obtained will not give a true indication of the child's performance level. In those parts of the test where lack of vision impairs the child's ability to respond as promptly and as accurately as others, then extra time is allowable — in most cases, 10 minutes for every hour duration of the test, and amanuensis attention can be provided if needed. Make sure that a clear type script is provided for him.
9. Through regular consultation with the rest of the staff, you can help achieve acceptance by encouraging other teachers and pupils to feel involved in his total school programme.
10. Differentiate the effects of limitations in vision from effects that have their sources in other causes such as emotions, intellect, hearing, attitudes and cultural background. Do not let the child exploit his visual limitations for special treatment.
11. It is tempting for you to exploit the visually impaired child by showing him off to other children, teachers or visitors. Resist the temptation, and treat him like you would any other child.
12. When in doubt, the regular teacher should do what she would consider best for any of her children, remembering that the child and the teacher will have access to a resource or Itinerant Teacher should the need arise.
13. Reading material for the partially sighted should be chosen with particular care. Paper should not be too thin, nor tinted with background colour. Print should be bold and black with wide margins and spaces between the lines. Look for clear definition, uncluttered and uncomplicated illustrations, and lack of "fussy" detail.
14. Your nearest Visual Resource Centre welcomes you to view the materials and equipment that is available to you.
15. Develop a genuine respect for the child's media for learning, be it braille, large-print, tapes, audio or tangible aids. Many of these can also enrich the education of all the children of your class, even though these are the specialized tools of learning for the visually impaired child.

Curricular Adaptations

Partially-seeing children can usually participate in most class activities. In fact this can be said also of many blind students. Adaptations may well be necessary, but the visual limitations should not form the basis of non-participation. It is recognized that there will be some subjects which are difficult for those with a visual condition, but there are many more which are now open to students for study because of the progress made in the area of tactile drawings, raised diagrams and clear-print illustrations. These are available if the teacher makes contact with the Resource Centre and seeks help and guidance from the services available.

Since comparatively few large-type books are being published (none in New Zealand — the supply source is by importing from U.K., U.S.A., etc), it may be necessary to resort to tactile or hand-drawn material for special sections or specific subjects. These may already have been done and

held in the Resource Centre files, waiting to be reproduced. If they are not, then by asking for them, they will be made available and the master copies held in stock until needed again by somebody else.

As an alternative to large-print material, it has been found more advantageous for the pupil to employ one of a variety of magnification aids. This enables a child to use materials printed in ordinary type, and thus eliminate the need for substitute material in large-print. Currently, greater concern is expressed for making the most of whatever remaining vision a person has. Excellent low-vision clinics are in existence, to ensure that the correct aid is prescribed. At considerable cost, some texts could be reproduced in enlarged form, page by page, and this is done when necessary.

The various subjects, how they can be adapted to the capabilities and limitations of the visually impaired student, are best discussed on an individual basis with the visiting Itinerant Teacher or by contacting the nearest Resource Centre.

Talking Book Machines, together with the appropriate cassette tapes, may also prove beneficial to a visually limited child, providing rest from continuous reading over long periods of time. The use of this equipment should not, however, replace reading as an activity. Resource Centres have direct access to the cassette library, and can respond to your requests for taped material. This machine does not use 2-track, 4-track or end-to-end reels and tapes — recordings have to be done on special tapes which are not interchangeable with any other machine.

With a visually limited child in your classroom, you and the other children will become more aware of the senses other than sight. Life is just brimming with experiences which should challenge *all* the senses. The presence of a visually impaired child may challenge you and your class to be "on your toes". He may encourage you to be more precise in language, as well as giving accurate definitions and directions, and making you more keenly aware of developing the other senses as channels of learning:-

TOUCH — textures, shapes, (using a light, exploratory touch), size, corners, plains, hard, soft, smooth, rough, slimy, dry, wet, squashy, crumbly, round, square, sharp, blunt, curved, furry, hairy, woolly, scaly, feathery, fluffy, prickly, straight, bumpy, lumpy — we often don't realize how much we miss by relying so much on vision alone. Models are useful, but the real things are best.

HEARING — It is possible to be surrounded by a world of a myriad sounds and to be conscious of only a few of them, because our hearing tends to be passive. We should encourage creative listening. Developing an acute sense of hearing is of great help in establishing mobility and orientation skills. Encourage identification of both the sounds heard and their sources, and where possible, the direction if the sound is from a moving object. This becomes a stimulating exercise for the whole class with its associated discussion, language, definition and identification activities.

SMELL — Help the child to observe odors, both pleasant and unpleasant. Have you ever smelt the earth after rain, flowers in the garden, freshly cut fruit, salt air at the beach, roasted coffee beans, perfumes, the Christmas tree, cleaning fluid, antiseptic, burning rubber, decaying rubbish, body sweat after a long run, cooking, mint, vinegar, incense, new-mown hay, camp-fire breakfast bacon, animals?

TASTE — Wherever desirable and under hygienic conditions, and under supervision, children should be encouraged to taste as an avenue of gaining new concepts. As with the sense of smell, it helps to establish distinguishing qualities. Taste and smell are closely connected in many instances. For example, the taste of an apple is largely traceable to its aroma. When speaking of flavour or taste, we usually think of the many kinds of food, herbs and drinks — things usually associated with the mouth and eating. There are many other articles that can be identified by taste that are not usually associated with the act of consumption. Terms like sweet, sour, bitter, acidic, tasteless, salty, tart, spicy, etc, can be more clearly defined through a wider range of experiences.

B. CARE OF LOW-VISION AIDS

Some children who previously had been classified as "blind", have now learned to read print through the prescription of low-vision aids. These come in a variety of shapes and sizes, but are usually manufactured to individual requirements. They can include hand-held magnifying lenses, telescopic lenses attached to glasses frames, bi-focal and tri-focal lenses, miniscopes, closed-circuit television systems, specially illuminated magnifiers, and so on. Whether they are hand-held, worn or staticly set-up, each piece of equipment must be carefully handled and stored.

Glasses will be issued in special boxes or cases, together with a suitable cleaning cloth. Many of these lenses are constructed from heavy-duty plastic to lessen the weight on the bridge of the nose. If the lenses are placed onto any surface, no matter how dust-free that surface appears to the naked eye, over a period of time the lens surface becomes "cloudy" from minute scratches. It is advisable to place the glasses down in such a way that the lenses do not come into contact with anything else. If the glasses are not to be worn in the near future, they should be wiped and returned to their case with the cloth wrapped round them, and the lid closed. Many teachers adopt the system of issuing the glasses prior to their being used, and collecting them from the child before class is dismissed, keeping them safely in her desk during breaks. Breakages will always occur, and if the parents are able to afford a second pair for standby use, this permits the child's educational programme to continue uninterrupted through glasses being away for repair.

Special lenses that are attached to a glasses frame will probably be prescribed for specific tasks. Microscopic lenses enable the child to read printed material at very close range, even as close as his nose-tip. But it should be pointed out that without the aid, the child would not be able to read at all. Telescopic lenses permit the child to view distant things more clearly — the chalk-board, television, etc. It may or may not have an ability to change the focal distance. These lenses would not be used as consistently as glasses, and would need to be carefully stored when not in use. Again, dust needs to be avoided, particularly the fine, gritty and abrasive chalk dust getting into the moving parts. Soft-hair brushes and cleaning cloths are usually issued along with the aid, and should be used each time the aid is returned to its box.

Patience will need to be exercised in a situation where one child may need to use two different lenses alternately to view distant, then close material. It should be mentioned

that with these aids, the greater the powers of magnification, the smaller the area that can be seen. The result is that there may be only a few letters visible at a time to the viewer, and this creates a painfully slow reading or performance speed. In addition to patience, the teacher must exercise understanding, and give encouragement for the child's every success, no matter how small or laboured. In using the telescopic lens, the material viewed would need to be very steady, not moved around. It is quite understandable for some children to give up using their aids, and it takes considerable perseverance to master skills in using the aids to their fullest advantage. This becomes a difficult task for the teacher where the child lacks adaptability and patience himself, or is poorly motivated to use the special lenses. The one gratifying aspect is that a growing number of children now have the means by which they can function more effectively in a sighted environment.

Hand-held magnifiers are far more common, and can be an additional aid for all class members in a variety of situations. Where the visually limited child is concerned, he needs this aid for more of his visual tasking, where his unaided vision lets him down. More frequently it will be for close work. These aids, while not so expensive, and more readily available, should still be carefully handled and looked after.

The most expensive aids (C.C.T.V., Visualtek, Viewscan, etc) suffer from being relatively difficult to move around from place to place. Once set up, the child usually has to take his material to the equipment to perform his tasks. Unless they are in a secure area, and locked away in out-of-school hours, they present a great temptation to other children to "play" with the aid. Servicing a non-functioning aid is time consuming and expensive, and frustrating in the extreme to the legitimate user. It would pay the teacher to seek training in the use of this elaborate equipment, should you find that a child in your class requires this aid. You are then able to bring it into use on every occasion it is needed, allowing your student a greater exposure to printed material than he would probably take to the machine on his own initiative.

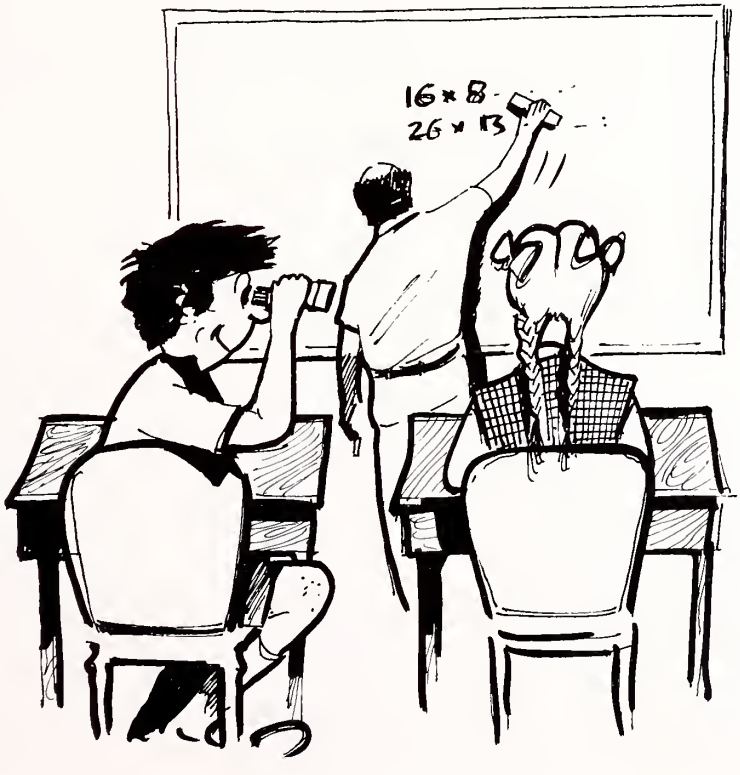
Problems inherent in illuminated aids concerns mainly the convenient availability of a power-point, and the flex across the floor where there is constant movement. Careful thought and perhaps some slight re-organization may alleviate the problem. And there is always the chance that the handyman can call in the electrician to provide you with an additional power-point!

To summarize, the teacher should find out what aids have been prescribed, how they work, when they are to be used, and any special care that needs to be taken of them, and where to get replacements or who to contact for servicing or repairs. Make a note in the child's file for quick referral, and exercise common sense at all times. For the child, encourage him to use them properly, responsibly and whenever necessary, teaching him to care for his own equipment, and to explain to the rest of the class the necessity for their respect towards his equipment.

C. TESTING AND EXAMINATION PROCEDURES — CONCESSIONS

It will have already been noticed that there are a great variety of visual defects. Each single condition will have a range of severity from slight to profound. In many individuals more than one eye defect co-exists. There will also be variations from student to student in their attitudes towards being partially sighted and their ability to cope with the visual problems they have. Some will be classified as "multi-handicapped", visual problems forming just one of the recognized categories. In short, no two students are identical in their requirements.

Where intelligence levels allow the student to sit tests and exams at the appropriate grades, some concessions will need to be made to permit the handicapped candidate to compete on an equal footing with his sighted peers. These concessions should not be viewed as fully compensating for



poor vision, but rather an acknowledgement that difficulties exist in areas of reading speed, and seeing relative details accurately and quickly.

Taking all the variations of vision and the personal abilities to cope (as detailed in the first paragraph), some standardization of the concessions must be identified as applicable to the majority of cases. Over years of negotiations between the personnel involved with these problems, several policies and procedures have been advanced, revised and approved as acceptable. Discussions continue in some areas (notably in the Typing exams), and no doubt the policies and procedures may undergo further changes in the future.

As a general rule, for tests and exams involving reading print or visual tasking (e.g. P.A.T. — except "Listening Skills", T.O.S.C.A. and OTIS intelligence tests, and classroom "surveys" set by the teacher on a regular basis to monitor each child's performance levels in the curricuum subjects) extra time of 10 minutes for every 1 hour duration of the test should be allowed. If this proves too much of an inconvenience to organize, a percentage mark-up on the raw score could be substituted (though care would need to be exercised). In either case, I have usually advised the teacher to rely more on her "gut feeling" as to the child's ability, performance level or suitability for grouping, than to stick rigidly to test scores. To assist in providing the best and least restrictive conditions for testing, clear print copies of the test should be available (enlarged print when necessary), with clear and uncluttered definition in all diagrammatic or illustrative material.

The Department of Education Examinations Division circular 1982/83 titled "*School Certificate: Handicapped Candidates*" is quoted in this instance —

"VISUALLY HANDICAPPED CANDIDATES

5. Blind or Partially sighted candidates have usually had some association with Homai College or one of the official Visual Resource Centres in Wellington, Christchurch or Dunedin. The Department works closely with these agencies in making the special arrangements for these students.
6. Any application for special arrangements for a blind candidate should be made to the Director-General by the Principal of the school who should specify in the application the nature of the arrangements being sought. The Principal of Homai College, or the senior teacher at the local Visual Resource Centre, would be pleased to advise school principals on the specific needs of individual students. For blind or partially sighted students the common arrangements are for one or more of:
   — examination papers prepared in braille
   — examination papers prepared in extra large print as well as the normal size
   — the use of a braille typewriter
   — the assistance of an amanuensis

   In such cases it is usual for the Department to provide a separate supervisor so that the student may take the examination in a separate room. An extra 30 minutes per paper is allowed.
7. Alternatively, blind or partially sighted candidates may be classified as having a physical disability. Application may, therefore, be made for them to take the examination under the conditions set down in the paragraph for "Candidates who are Physically Disabled". In the instances where these candidates are sitting the examination but have been approved for aegrotat assessment, an extension of time is not permitted."

Separate supervision is necessary because of the distractions caused by other candidates arriving at or leaving the exam room when the visually impaired candidate is half an hour into his exam (if the additional time is given prior to the 3-hour exam period) or endeavouring to finish his final question (if the extra 30 minutes is added at the conclusion of the 3 hours for the other examinees). Concentration obviously becomes very difficult at these times. Disabled students may also cause distraction to the other candidates when they use constantly clacking typewriters or clicking braille machines.

The Advisory Service at Homai College makes available the following information circular, approved by the Department of Education Examinations Division, to secondary schools where visually impaired candidates are sitting external exams. Each candidate's specific needs will be discussed with the Principal and school staff by the Adviser and/or the Itinerant Teacher, prior to the application for concessions being forwarded to the examinations division.

D. FUNCTIONAL VISION

Perceiving and functional vision, or visual ability are processes which must be learned. Teachers can help those with some sight, no matter how little, to see what they are capable of seeing. In some cases visual ability is improved as it is practiced. Unfortunately, some individuals have vision which they do not take full advantage of simply because they have not learned to use it. Here I make the differentiation between 'visual acuity' which is the **measurable** degree of vision, and 'visual acuity' which is the degree to which a person **uses** what sight he has.

Residual vision may be measured by testing light perception, colour perception or object perception. Many people have the misconception that if a person is 'blind' he sees nothing at all. However, a legally blind person may still have some vision and he should be taught to use it to his own advantage. It is generally recognized that the use of whatever sight may remain does **NOT** impair or aggravate most eye conditions. Note that some children require reduced glare while others need maximum illumination.

A child with just light perception may be taught to use whatever he can see to help him get around more adequately, comfortably and with more self-assurance.

A child with colour perception may not be able to draw a picture in much detail, yet he will probably enjoy working with bright coloured paper, looking at coloured pictures, or experimenting with paints, chalks and crayons.

Children with object perception should be encouraged to make maximum use of whatever sight they may have by giving them attractive materials, by providing comfortable lighting, and by initiating reasons for using that sight which the children understand. As in the case of the child with colour perception, you might experiment with the use of kaleidoscopes, pictures of various sizes and colours, or coloured paper.

As a final statement to this chapter, there are individuals who tend to think that blind people have a sixth sense, providential compensation or extraordinary talent. Usually a combination of hard work, the cultivation of a good memory and the development of latent faculties permit some blind people to function at a very high level. The "sixth sense" is a poetic phrase having no foundation in truth.

CHAPTER 7

THE ROLE OF HOMAI COLLEGE AND THE R.N.Z.F.B.

In the chapter "Classroom Screening — Identifying a Child with Visual Dysfunction" I dealt with the problem of the child with an undetected eye condition. In this chapter, the services and training programmes undertaken by the Foundation are explained in more detail, and in particular, how these services can help you as a teacher in a regular classroom. It is assumed that for a child to have been registered with the Foundation, his visual problems (or condition) are severe enough for this measure to have been considered necessary. For this reason alone, expert advice and expertise will be necessary for providing an educational programme that meets his visual needs. If he has been referred to the Foundation, but his registration has been declined, you may consider his visual problems to be, at this stage, of minor intensity — but because he has been referred, he will continue to be observed periodically, and you can expect some contact from the Foundation personnel. Help and assistance are always available — all you need to do is to ask for it, if it hasn't already materialized.

Until 1955, care of the blind and partially sighted in New Zealand was undertaken by "The N.Z. Institute for the Blind". By Act of Parliament in that year, the name was changed to "The N.Z. Foundation for the Blind" to record for all time that the organization was originally founded by public support (as early as 1889), and that continuation of public support is essential for the maintainance of our nation-wide services to blind and visually impaired people. Amendments to the original Act in 1959 and 1963 consolidated the constitution by which the Foundation now functions. The prefix "Royal" was added by Royal Charter in 1972. Through the constitution of the Act, the general purposes of the Foundation are

1. to provide for the care, relief, education and training of blind persons, the amelioration of their condition and the maintainance and promotion of their general welfare.
2. to provide and maintain such institutions, establishments, accommodation, services and equipment for the benefit of blind persons as may be necessary or expedient from time to time.

For administrative and welfare purposes, the R.N.Z.F.B. has divided New Zealand into 4 regional districts — Auckland, Wellington, Christchurch and Dunedin. It provides in each area services of welfare, social centres, counselling services at all age levels, practical help for elderly folk (who make up to 70% of registered members), equipment and aids for the blind, trade training and employment openings, hostel accommodation when necessary, library services (including large-print books and Talking Books), rehabilitation for newly blind adults, mobility training (using the most sophisticated and up-to-date aids), professional/commercial/industrial job placement, travel and other concessions, monthly magazines and other informative publications, support to relations and friends of blind people, social activities, and creating public awareness of the needs of blind people. The one major activity that provides finances to support all these services is Braille Week, usually held in November when the Foundation appeals to the N.Z. public for support. It is the one major source of revenue. Much help is provided by volunteer workers in braille clubs, readers for the blind, service clubs (e.g. Lions, J.C.'s, Rotary, etc); much support is also done in businesses and schools in educating workers and children in preventing eye accidents, instruction in eye hygiene, eye safety, and general awareness of how valuable a sense sight is. It all boils down to permitting a blind or visually impaired person to function to the best of his ability in a fully sighted world, managing in surroundings that he can't physically see, and making him feel accepted as an equal with his sighted peers, aware that he has as much to contribute to society as anyone else, and to take his place proudly beside his workmates and friends.

Apart from the many buildings and groups of people scattered throughout the country who provide these services, perhaps the most important and certainly the most complex, is Homai College. It is the Foundation's residential school and educational centre, situated in Manurewa near Auckland. The College is designed to cater for the needs of educating and training totally blind, partially sighted, deaf-blind and multi-handicapped/ visually impaired children of N.Z. and its Pacific Ocean dependencies. It provides special educational training for visually impaired people from pre-school age to tertiary level. During their term of residence, the children's abilities are assessed and developed, and the training programme adapted to suit their particular needs so that they learn to lead useful and active lives within the community, despite their disabilities; competing successfully with their sighted peers in the working world once adulthood has been reached.

The staff at Homai College (teachers, house-staff, medical specialists, psychologists, physiotherapists, as well as the administrators) are specialized personnel in the field of the visually impaired. Children attending from out of the greater Auckland areas (those who do not travel daily to school by bus or car) are accommodated in hostels. Pupils are drawn from throughout N.Z. and many of the South Pacific Islands.

A child's exposure to Homai College may well start at the Pre-School Developmental Unit, aimed at establishing the basic habit-forming patterns that other children acquire by sight observations and mimicry. This prepares him for his school days ahead by reducing the retardation caused by his sight handicap. This period also enables the staff to assess to what extent any child's problems may be caused by factors other than visual, and thus employ additional help at an early age to deal with non-visual matters. This service is also provided in the home setting, supportive to the parent. A pre-school services officer is employed to visit homes of parents who have a child with a visual condition, and is usually involved with that child's training and education through to the age of 8, when the Advisory staff and Itinerant Teacher Service take over (should that child continue his eductional programme in his home school).

Any class at Homai College itself could be any classroom in any school anywhere in the country, except

perhaps for the clicking of braille machines or the clacking of typewriters. Normal school programmes are being conducted, though the class numbers may be smaller than you would find in an ordinary school. In a few cases only will you see a child using sophisticated aids for reading print, or studying an atlas, or calculating maths problems. Some (but certainly not all) may be wearing glasses, and then for only some activities. In many respects they look, behave and perform like any child in any school — and this is a very pertinent observation! They **ARE** normal children, most of them. Instead of having a mole on the arm or a hand-fluttering mannerism or a talkative disposition that distinguishes one child from another, they don't see as well as other children. But in all other respects they are normal kids. They are working from M.S.M. Bk III, learning from the N.Z.C.E.R. level 4 spelling list, finding the map co-ordinates of Los Angeles city, stuck on long multiplication of 3-figure numbers, completing an illustrated assignment of "Life in a Maori Pa". A child does his education at Homai College only when he is unable to cope (sometimes only temporarily) with a normal classroom setting. The College's aim is to provide a complete educational rehabilitation, which may or may not include a few special aids, to enable him to function more adequately in spite of his sight disability, and then to return him to his former school. Usually his "newly acquired ability to cope" enables him to settle down quite happily once he returns home. Sometimes this return is just not possible, due to the severity of the handicap, and in this case, Homai College provides a good all-round education for them, based on their particular and individual needs, be it through the services of the reading specialist, or acquiring the skills necessary for everyday living. Yet the student does not become institutionalized — he is encouraged to integrate, to socialize with non-handicapped peers, to compete on his own level with sighted children, thus preserving (or developing) his awareness of what a sighted world and community is like. He will not spend his entire life at Homai College.

When he is ready to return to his home school, several things happen. Usually the school is visited and preparations are undertaken prior to his arrival. The visual condition and the limitations it imposes are explained to the Principal and those most likely to need this information. If the pupil is to use visual aids, their care and maintainence is also explained.

Once the child has arrived at his home school, Homai College personnel will visit your school to assist and/or support you in the classroom with regard to your visually impaired child. He may require continuation of the intensity of work and specialized help that he received at Homai College in specific areas, and the Itinerant Teacher would then make weekly visits to cater to this specific area of need. Otherwise, the Adviser will visit periodically when in the district.

The key word of these services is **SUPPORT** to:

(i) the teacher in her efforts to provide the appropriate programme, and

(ii) the pupil to capitalize fully on all that is offered to him. The intensity of this support is dictated by many factors —

(1) the child's level of education — high intensity involvement appears more frequently at the Infant School level, and again about the Form IV-V level.

(2) the child's level of performance — he may function well at all social lessons, but need special assistance at reading and maths.

(3) the child's level of independence — his ability to cope with the work load, his general attitudes to school work, and his ability to work independently.

(4) the level of sophistication of aids prescribed, to enable the child to be placed in a regular classroom.

(5) the position of the school — country schools in isolated areas are a little more difficult to service than those close to supportive facilities.

(6) the general work load of the Itinerant Teacher and the Adviser in any particular area.

(7) the particular requirements of the teacher, school staff in general, or the school itself, in providing a specialized programme,

(8) the parents' wishes.

Taking these factors into consideration for each individual placement, the Itinerant Teacher may visit for specific lessons as frequently as 1 hour each day of the week (if this is thought to be necessary), or to make contact once each term. The Adviser, who services districts out of the areas close to the four Visual Resource Centres, may make calls only once or twice each year, depending on the need. At any time between visits, phone or letter contact can be made to meet crisis or explanatory situations.

The Itinerant Teacher Service, employing specially trained and experienced personnel, is available within the four main metropolitan areas of New Zealand where the greater majority of child membership exists. The Itinerant Teacher's duties cover visiting and liaison with schools as frequently as is thought to be necessary to maintain the visually impaired child in a regular classroom; providing the support to the teacher and the pupil to an extent that the pupil continues to make acceptable progress in coping with the school curriculum; submitting periodic reports on the child's visual ability, visual efficiency and capability in coping with the workload; discussing and advising on the problems that may occur from time to time; aiding the child's fullest possible participation in classroom or school activities. The support may take the form of the Itinerant Teacher sitting in the classroom during the lesson to assist the teacher to present the work to the pupil in a form that is meaningful for him, or that the pupil is removed from the class group for one-to-one instruction for a specific series of lessons or to learn particular skills.

Behind and supporting the Adviser and the Itinerant Teacher teams are the Resource Centres, located at each of the four main cities. The principal duties of these centres is to prepare and provide specialized material and supply equipment as requested by the schools through the Adviser or Itinerant Teacher. Any master copy of braille, large print or simplified diagram is done by experienced staff at the centres and stored away for future use. By this means, a comprehensive coverage of material from infant activities to the more specialized information of secondary school subjects is kept in storage to be used in response to any request received from any school in the country. As new material and work units are released to the schools, so this is adapted for use by visually impaired students and held at the centres until needed.

The general policy of the Advisory and Itinerant Teacher Service in integrating the visually impaired child with sighted children in a regular local school, is that special assistance would be needed to overcome the limitations

imposed on the child by his visual condition. The basic aim of the Service is to supply this special assistance to the visually impaired child (either to him directly or through his classroom teacher) so that he can achieve his optimum potential and function as independently as possible; and to create awareness in the sighted community of the needs as well as the abilities of the low-vision child.

The objectives of the Service, then, become the provision of adequate preparation before placement of the pupil, with supply of material and professional help as a follow-up. This support is detailed as —

(1) the placement of the child in a suitable environment for his continuing educational development, socially as well as academically.

(2) the imparting of information to those significant adults who are responsible for his educational programme so that his individual needs and requirements are understood and met.

(3) to ensure that the child is making full use of any functional vision which he may have, by the availability of low-vision aids, specialized materials and equipment, regular ophthalmic visits and monitoring any changes in visual acuity.

(4) the continuation of orientation and mobility skills involved in all out-of-classroom activities which would include sporting, games and physical education participation as far as is possible, and socializing with the other children during break times.

(5) the continuation of communication skills — oral, and written (in a variety of media, including handwriting, typing, braille, tapes, etc).

(6) the continuation of social and emotional development, with the counselling service, vocational guidance, and profitable leisure-time activities playing their part.

(7) providing professional advice and help wherever and whenever necessary.

ROYAL NEW ZEALAND FOUNDATION FOR THE BLIND

Examination Concessions for Visually Handicapped Candidates.

When a candidate for School Certificate, or other public examination, is visually handicapped, application can be made for concessions in time, transcription and supervision. Any application should be made by the school to the Education Department or the University Grants Committee.

If the child is registered with the Royal New Zealand Foundation for the Blind, it might be wise to mention this in the application. Not all partially sighted people are registered with the R.N.Z.F.B. Some of these have very limited vision and in such cases, it is suggested, an appropriate medical certificate should accompany requests.

In the past, concessions have been allowed in the following ways:

1. Time — extra time on the basis of 10 minutes in the hour — 15 minutes in the hour when multiple choice questions are included. Extra time should be granted before the normal starting time.

2. Transcription — papers for the totally blind are brailled. The partially sighted child is usually best served if he is given papers in clear type. This is normal in size, double spaced, black print on white paper. In the rarer instances of loss of central vision, large print may be necessary.

3. Supervision — this should occur in a separate room. A special supervisor should be appointed. A guide to supervision is attached.

Notes for Supervisors of Blind and Partially Sighted Examination Candidates

Equipment should be checked before and during the examination.

Have your own copy of the examination paper.

It may be necessary to read the paper aloud marking those sections the candidate chooses to do.

See that name, date, number are entered on the script.

Tell the candidate that at any time you are prepared to read back what he has typed or written.

Care should be taken that the typewriter ribbon is working.

Rustling newspapers and clicking knitting needles disturb candidates.

If there is time, read back the answers watching for typing errors that the examiner might think are mistakes in spelling.

Put in punctuation as directed by the student.

Attach to the answer sheets your note that the candidate is handicapped to the extent that he is.

Generally, place the candidate on an equal footing to his sighted counterpart.

But special care should be taken against being over-solicitous. Don't waste the candidate's time.

APPENDIX A.

Criteria for Admitting Visually Impaired Children into the Integrated Programme (Homai College, 1983)

There are check points built into the New Zealand state system of education — e.g. Journals are arranged according to reading levels; mathematics text books are arranged according to ability levels; syllabuses in science, social studies, music and art increase in complexity.

To be deemed ready for integration into the state system, not only do students who are blind or partially sighted need to achieve at comparable levels to their sighted peers, but in addition, they must reach levels of competency in specific areas that are unique to their learning situation. These areas are —

BLIND	PARTIALLY-SIGHTED
1. **BRAILLE** — to be able to read and write Grade 2 braille at their reading age level without confusion.	**PRINT** — to be able to read print at a level where their reading age and chronological age are compatible, and where reading speed is at least between 75-125 words per minute, using any prescribed aids.
2. **SIGNATURE** — to be able to write one's signature between raised lines.	**WRITING** — to be able to write in a legible style (cursive or print).
3. **OPTACON** — to be familar with this machine.	

4. **TYPING** — to achieve a level of competency and speed according to age, co-ordination and developmental level; to use typing as a means of developing good spelling technique.

5. **MATHS DIAGRAM CONSTRUCTION** — to be able to draw straight lines, triangles, circles, etc, and to be able to manipulate compasses and set-squares to aid in the understanding and recording of the geometrical requirements of the maths syllabus.

6. **NEMETH CODE** — to be able to use the Nemeth Code to record and/or understand mathematical requirements at the appropriate developmental level.

7. **ABACUS** — to be able to use one or more abacii to add, subtract, multiply and divide at the appropriate curriculum level.

8. **THREE DIMENSIONAL SHAPES** — to be able to recognize familiar shapes irrespective of size, texture or material (this would include familiar objects).

9. **RAISED LINE DRAWINGS** — to be able to manipulate the embossing board, the plastic sleeve and stylus.

10. **MAP USAGE** — to have completed a course of study related to shape, orientation and raised line studies that enable the student to use maps, graphs and diagrams in a meaningful manner appropriate to the individual's curriculum level.

11. **MOBILITY** — to be able to move with confidence and in a co-ordinated way, initially using basic techniques, but when ready, with a long white cane, following and implementing sound mobility principles.

12. **ORIENTATION** — to be able to locate, move away from and return to all reference points in their home, classroom, school block and playground without a white cane. This environment would need to be regularly safety checked.

13. **PHYSICAL EDUCATION** — to be as fit as one's peers through the selective use of exercises and activities that are appropriate for students who are blind or partially-sighted.

14. **MANIPULATIVE SKILLS** — to develop a sensitivity of touch for careful tactile exploration through sensitive fingers; to develop gross motor and fine motor manipulative skills that include turning, holding and screwing movements.

15. **LISTENING SKILLS** — to avoid passive listening as an alternative to actions and creative and lateral thinking; to use the spoken word as a motivator for improved braille and print reading and motor performance.

16. **MUSIC** — through early exposure to music and through continued encouragement, instruction to develop music as a "mother tongue"; to progress in a wide variety of performance skills and, during the primary school years, to be introduced to braille and printed music; to be able to play more than one instrument.

17. **TECHNIQUES OF DAILY LIVING** — to be able to dress, toilet, eat and converse unaided, at an appropriate developmental level.

18. **IMITATION** — So much of the behaviour of sighted children is learned through imitation that this topic should be treated as one requiring the attention of all the visually impaired.

19. **SELF AWARENESS** — at the elementary level, to be aware of one's body, its anatomy and physiology; at the adolescent and adult levels, to be aware of one's motivations, feelings, drives and social relationships; at all levels, to be able to accept and to give.

20. **INDEPENDENCE** — to have an ability to ask for assistance, without embarrassment, at the time it is needed, yet still take initiative to attempt new work and activities before seeking help.

21. **SOCIALIZATION SKILLS** — to be able to take the initiative in making social contact; to be able to make friends and keep them.

Much of the above will apply in part or in whole to those who are blind or partially-sighted, but there are some fields that will be unique to this group, and as such, these areas will require the defining of standards. Thus,

(a) to what extent are standards of performance influenced by the effect of the particular visual condition on the child's visual image and/or understanding of print, pictures, and near and distant objects?

(b) is the student reading at the maximum level, consistent with his visual ability, or is his reading standard affected by factors other than his visual disability?

(c) is the standard of his speed of reading commensurate with his reading level, his reading age, and his visual limitations?

(d) has the student a high level of tolerance for teasing?

(e) does he fully understand and appreciate the effectiveness of the aids which have been prescribed; does he utilize them at appropriate times?

T.L. Rogerson
Principal

APPENDIX B

A List of Supporting Services available in New Zealand:

1. Royal New Zealand Foundation for the Blind
   Head Office, Private Bag, Newmarket, **AUCKLAND.** Ph 774-389.

2. **R.N.Z.F.B. Branches.**

Auckland —	Private Bag, Newmarket,	Ph. 774-389
Wellington —	P.O. Box 12080,	Ph. 856-755
Christchurch —	P.O. Box 1696,	Ph. 559-005
Dunedin —	P.O. Box 3056, Forbury,	Ph. 51-154

3. **Visual Resource Centres.**
   Auckland Visual Resource Centre (Advisory Service)
   Homai College, R.N.Z.F.B.,
   P.O. Box 67,
   MANUREWA. Ph 266-7109.

   Kelburn Visual Resource Centre,
   Kelburn Normal School,
   Kowhai Rd,
   WELLINGTON Ph 758-020.

   Elmwood Visual Resource Centre,
   Elmwood Normal School,
   Aichman's Rd,
   CHRISTCHURCH. Ph. 557-192 or 556-010

   Forbury Visual Resource Centre,
   Oxford St,
   Forbury,
   DUNEDIN. Ph. 54-356.

4. **Advisory Committees, of the R.N.Z.F.B., are located at:**

Ashburton	Hokitika	Opotiki	Timaru
Balclutha	Invercargill	Paeroa	Tokoroa
Blenheim	Kaikohe	Palmerston North	Waipukurau
Dannevirke	Kaitaia	Rotorua	Wairoa
Dargaville	Levin	Stratford	Wanganui
Gisborne	Masterton	Taihape	Westport
Gore	Matamata	Taumarunui	Whakatane
Greymouth	Napier	Taupo	Whangarei
Hamilton	Nelson	Tauranga	
Hastings	New Plymouth	Te Kuiti	
Hawera	Oamaru	Thames	

5. Psychological Services

Head Office —	Govt. Bldgs, Private Bag,	WELLINGTON.	Ph. 735-499.
Auckland —	Box 28341, Remuera,	AUCKLAND.	Ph. 503-150.
Birkenhead —	Box 34250, Birkenhead,	AUCKLAND.	Ph. 487-049.
Christchurch —	Box 2612,	CHRISTCHURCH.	Ph. 69-729.
Christchurch South —	(as above)		
Dunedin —	Box 5147,	DUNEDIN.	Ph. 78-610.
Gisborne —	Box 658,	GISBORNE.	Ph. 87-824.
Glen Eden —	Box 20216, Glen Eden,	AUCKLAND.	Ph. 818-7556.
Greymouth —	Box 246,	GREYMOUTH.	Ph. 7210.
Hamilton —	Box 774,	HAMILTON.	Ph. 82-226.
Hastings —	Box 1420,	HASTINGS.	Ph. 65-346.
Hawera —	Box 187,	HAWERA.	Ph. 84-910.
Kaikohe —	Box 466,	KAIKOHE.	Ph. 1092.
Levin —	Box 287,	LEVIN.	Ph. 88-309.
Lower Hutt —	Box 30177,	LOWER HUTT.	Ph. 660-337.
Manurewa —	Box 566,	MANUREWA.	Ph. 266-8181.
Masterton —	Box 880,	MASTERTON.	Ph. 81-491.
Mt Albert —	Box 8729, Mt Albert,	AUCKLAND.	Ph. 743-146.
Napier —	Box 664,	NAPIER.	Ph. 54-603.
Nelson —	Box 282,	NELSON.	Ph. 82-344.
New Plymouth —	Box 487,	NEW PLYMOUTH.	Ph. 87-858
Pakuranga —	Thurston Pl, Bucklands Beach	AUCKLAND.	Ph. 535-5031
Palmerston North —	Box 1154,	PALMERSTON NORTH.	Ph. 83-026.
Papatoetoe —	Box 23638, Hunters Corner,	PAPATOETOE.	Ph. 278-4840.
Porirua —	Box 50136,	PORIRUA.	Ph. PRO 76670.
Remuera —	Box 28341, Remuera,	AUCKLAND.	Ph. 503-151.
Rotorua —	Box 701,	ROTORUA.	Ph. 85-145
Southland —	Box 832,	INVERCARGILL.	Ph. 83-169.
Takapuna —	Box 33137,Takapuna,	AUCKLAND.	Ph. 498-372.
Taupo —	Box 986,	TAUPO.	Ph. 89-252.
Tauranga —	Box 871,	TAURANGA.	Ph. 89-438.
Thames —	Box 386,	THAMES.	Ph. 89-490.
Timaru —	Box 155,	TIMARU.	Ph. 86-843.
Wanganui —	Box 4045,	WANGANUI.	Ph. 55-224.
Whakatane —	Box 2138,	WHAKATANE.	Ph. 8604.
Whangarei —	Box 911,	WHANGAREI.	Ph. 87-677.
Wellington —	Box 27382, Upper Willis St,	WELLINGTON.	Ph. 847-644.

APPENDIX C.

Bibliography of Resource Material.

Alder, F.H. *"Textbook of Ophthalmology"* (4th Edition)
W. B. Saunders Co., Philadelphia, U.S.A. 1963.

Bauman, M.K. *"The Visually Handicapped Child in School"*
John Day, N.Y., U.S.A. 1973.

Bishop, Virginia E. *"Teaching the Visually Limited Child"*
Chas C. Thomas, Springfield, Illinois, U.S.A. 1978.

De Haan, R.F. and Kough, J. *"Helping Children With Special Needs"* Vol. 2
S.R.A. Inc., Chicago, Illinois, U.S.A. 1968.

Faye, Eleanor E. *"Clinical Low Vision"*
Little, Brown & Co., Boston, U.S.A. 1976.

Gregory, R. L. *"Eye and Brain — The Psychology of Seeing"* (3rd Edition)
World University Library, McGraw-Hill Book Co., N.Y., U.S.A. 1978.

Haber, R.N. and Hershensen, M. *"The Psychology of Visual Perception"*
Holt, Reinhart & Winston, U.K. 1974.

Kirk, Samuel A. *"Educating Exceptional Children"*
Houghton Miffin Co., Boston, U.S.A. 1962.

Kough, J. and De Haan, R.F. *"Identifying Children With Special Needs"* Vol. 1.
S.R.A. Inc., Chicago, Illinois, U.S.A. 1955.

Marshall, G. H. *"The Eyes and Vision"*
Exhall Grange School, U.K.

Scholz, Roy O. *"Sight — A Handbook for Laymen"*
Hodder & Stoughton, London, U.K. 1962.

Vaughan, Cook and Asbury *"General Ophthalmology"* (4th Edition)
Lange Medical Publications, Los Altos, Calif., U.S.A. 1965.

INDEX

ANECDOTAL RECORD SHEET

This is designed to be photocopied for your own use.

1. **PERSONAL**

PUPIL'S NAME: ..... D.O.B.: .....

HOME ADDRESS: ..... Phone No.: .....

EYE CONDITION: .....

VISUAL ACUITY: R.E. ..... / ....., L.E. ..... / .....

VISUAL AIDS USED: .....

OPHTHALMOLOGISTS NAME: ..... Phone No.: .....

ADVISORY SERVICE VISITING TEACHER'S NAME: .....

CONTACT ADDRESS: ..... Phone No.: .....

2. **EDUCATIONAL**

YEAR –

P.A.T. Percentiles – Comprehensive

– Vocabulary

– Listening

"BURT" Reading Age

Reading Level

Reading Speed in words/minute

Spelling Level

Maths Level (P.A.T.)

I.Q. Test Score

Handwriting (neatness, etc.)

3. **SOCIALIZATION** (Observations)

i Ability to make and keep friends .....

.....

ii Level of independence .....

.....

iii Efforts at joining in sporting, games and group activities .....

.....

iv Self-image, level of confidence, etc. .....

.....

v Ability to cope with problems, changes, etc. .....

.....

vi Perseverence, co-operation, etc. .....

.....

4. **SPECIALIST NOTES**

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HV5626 McKenzie, D. Ross c.1
M 199 ...AND AS YOU CAN SEE...
A MANUAL FOR TEACHERS WITH
A PARTIALLY SIGHTED PUPIL...
(1984)

DATE DUE

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M 199
McKenzie, D. Ross.
...AND AS YOU CAN SEE...A MANUAL
FOR TEACHERS WITH A PARTIALLY
SIGHTED PUPIL...
(1984)

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15 WEST 16th STREET
NEW YORK, N.Y. 10011